

MIND

A QUARTERLY REVIEW OF PSYCHOLOGY AND PHILOSOPHY

I.—UNIVERSALS.

BY F. P. RAMSEY.

THE purpose of this paper is to consider whether there is a fundamental division of objects into two classes, particulars and universals. This question was discussed by Mr. Russell in a paper printed in the Aristotelian Society's proceedings for 1911. His conclusion that the distinction was ultimate, was based upon two familiar arguments, directed against the two obvious methods of abolishing the distinction by holding either that universals are collections of particulars, or that particulars are collections of their qualities. These arguments, perfectly sound as far as they go, do not however seem to me to settle the whole question. The first, which appears again in "The Problems of Philosophy," shows as against the nominalists that such a proposition as "This sensedatum is white" must have as one constituent something, such as whiteness or similarity, which is not of the same logical type as the sensedatum itself. The second argument, also briefly expounded in McTaggart's "Nature of Existence," proves that a man cannot be identified with the sum of his qualities. But although a man cannot be one of his own qualities, that is no reason why he should not be a quality of something else. In fact, material objects *are* described by Dr. Whitehead as "true Aristotelian adjectives"; so that we cannot regard these two arguments as rendering the distinction between particular and universal, secure against all criticism.

What then, I propose to ask, is the difference between a particular and a universal? What can we say about one which will not also be true of the other? If we follow Mr. Russell, we shall have to investigate three kinds of distinction,

psychological, physical and logical. First we have the difference between a percept and a concept, the objects of two different kinds of mental acts; but this is unlikely to be a distinction of any fundamental importance, since a difference in two mental acts may not correspond to any difference whatever in their objects. Next we have various distinctions between objects based on their relations to space and time; for instance, some objects can only be in one place at a time, others, like the colour red, can be in many. Here again, in spite of the importance of the subject, I do not think we can have reached the essence of the matter. For when, for instance, Dr. Whitehead says that a table is an adjective, and Mr. Johnson that it is a substantive, they are not arguing about how many places the table can be in at once, but about its logical nature. And so it is with logical distinctions that our inquiry must mainly deal.

According to Mr. Russell the class of universals is the sum of the class of predicates and the class of relations; but this doctrine has been denied by Dr. Stout. But Dr. Stout has been already sufficiently answered. So I shall only discuss the more usual opinion to which Mr. Russell adheres.

According to him terms are divided into individuals or particulars, qualities and relations, qualities and relations being grouped together as universals; and sometimes qualities are even included among relations as one-termed relations in distinction from two-, three- or many-termed relations. Mr. Johnson also divides terms into substantives and adjectives, including relations as transitive adjectives; and he regards the distinction between substantive and adjective as explaining that between particular and universal. But between these authorities, who agree so far, there is still an important difference. Mr. Johnson holds that although the nature of a substantive is such that it can only function in a proposition as subject and never as predicate, yet an adjective can function either as predicate, or as a subject of which a secondary adjective can be predicated. For example in "unpunctuality is a fault" the subject is itself an adjective, the quality of unpunctuality. There is thus a want of symmetry between substantives and adjectives, for while a predicate must be an adjective, a subject may be either a substantive or an adjective, and we must define a substantive as a term which can only be a subject, never a predicate.

Mr. Russell, on the other hand, in his lectures on Logical Atomism,¹ has denied this. He says that about an adjective

¹ *Monist*, Oct., 1918—July, 1919.

there is something incomplete, some suggestion of the form of a proposition; so that the adjective symbol can never stand alone or be the subject of a proposition, but must be completed into a proposition in which it is the predicate. Thus, he says, the appropriate symbol for redness is not the word "red" but the function " x is red," and red can only come into a proposition through the values of this function. So, Mr. Russell would say, "unpunctuality is a fault" really means something like "for all x , if x is unpunctual, x is reprehensible"; and the adjective unpunctuality is not the subject of the proposition but only comes into it as the predicate of those of its parts which are of the form " x is unpunctual". This doctrine is the basis of new work in the second edition of *Principia Mathematica*.

Neither of these theories seems entirely satisfactory, although neither could be disproved. Mr. Russell's view does, indeed, involve difficulties in connexion with our cognitive relations to universals, for which reason it was rejected in the first edition of *Principia*; but these difficulties seem to me, as now to Mr. Russell, by no means insurmountable. But I could not discuss them here without embarking upon innumerable questions irrelevant to the main points which I wish to make. Neither theory, then, can be disproved, but to both objections can be raised which may seem to have some force. For instance, Mr. Russell urges that a relation between two terms cannot be a third term, which comes between them, for then it would not be a relation at all, and the only genuinely relational element would consist in the connexions between this new term and the two original terms. This is the kind of consideration from which Mr. Bradley deduced his infinite regress, of which Mr. Russell apparently now approves. Mr. Johnson might reply that for him the connexional or structural element is not the relation but the characterising and coupling ties; but these ties remain most mysterious objects. It might also be objected that Mr. Johnson does not make particulars and universals different enough, or take into account the peculiar incompleteness of adjectives which appears in the possibility of prefixing to them the auxiliary "being"; "being red," "being a man," do not seem real things like a chair and a carpet. Against Mr. Russell it might be asked how there can be such objects as his universals, which contain the form of a proposition and so are incomplete. In a sense, it might be urged, all objects are incomplete; they cannot occur in facts except in conjunction with other objects, and contain the forms of propositions of which they are constituents. In what way do universals do this more than anything else?

Evidently, however, none of these arguments are really decisive, and the position is extremely unsatisfactory to any one with real curiosity about such a fundamental question. In such cases it is a heuristic maxim that the truth lies not in one of the two disputed views but in some third possibility which has not yet been thought of, which we can only discover by rejecting something assumed as obvious by both the disputants.

Both the disputed theories make an important assumption, which, to my mind, has only to be questioned to be doubted. They assume a fundamental antithesis between subject and predicate, that if a proposition consists of two terms copulated, these two terms must be functioning in different ways, one as subject, the other as predicate. Thus in "Socrates is wise," Socrates is the subject, wisdom the predicate. But suppose we turn the proposition round and say, "wisdom is a characteristic of Socrates," then wisdom formerly the predicate is now the subject. Now it seems to me as clear as anything can be in philosophy, that the two sentences "Socrates is wise," "wisdom is a characteristic of Socrates" assert the same fact and express the same proposition. They are not, of course, the same sentence, but they have the same meaning, just as two sentences in two different languages can have the same meaning. Which sentence we use is a matter either of literary style, or of the point of view from which we approach the fact. If the centre of our interest is Socrates we say "Socrates is wise," if we are discussing wisdom we may say "wisdom is a characteristic of Socrates"; but whichever we say we mean the same thing. Now of one of these sentences "Socrates" is the subject, of the other "wisdom"; and so which of the two is subject, which predicate, depends upon what particular sentence we use to express our proposition, and has nothing to do with the logical nature of Socrates or wisdom, but is a matter entirely for grammarians. In the same way, with a sufficiently elastic language any proposition can be so expressed that any of its terms is the subject. Hence there is no essential distinction between the subject of a proposition and its predicate, and no fundamental classification of objects can be based upon such a distinction.

I do not claim that the above argument is immediately conclusive; what I claim is that it throws doubt upon the whole basis of the distinction between particular and universal as deduced from that between subject and predicate, and that the question requires a new examination. It is a point which has often been made by Mr. Russell, that

philosophers are very liable to be misled by the subject-predicate construction of our language. They have supposed that all propositions must be of the subject-predicate form, and so have been led to deny the existence of relations. I shall argue that nearly all philosophers, including Mr. Russell himself, have been misled by language in a far more far-reaching way than that; that the whole theory of particulars and universals is due to mistaking for a fundamental characteristic of reality, what is merely a characteristic of language.

Let us, therefore, examine closely this distinction of subject and predicate, and for simplicity let us follow Mr. Johnson and include relations among predicates and their terms among subjects. The first question we have to ask is this; what propositions are they that have a subject or subjects and a predicate? Is this the case with all propositions or only with some? Before, however, we go on to answer this question, let us remind ourselves that the task on which we are engaged is not merely one of English grammar; we are not school children analysing sentences into subject, extension of the subject, complement and so on, but are interested not so much in sentences themselves, as in what they mean, from which we hope to discover the logical nature of reality. Hence we must look for senses of subject and predicate which are not purely grammatical, but have a genuine logical significance.

Let us begin with such a proposition as "Either Socrates is wise, or Plato is foolish". To this, it will probably be agreed, the conception of subject and predicate is inapplicable; it may be applicable to the two parts "Socrates is wise," "Plato is foolish," but the whole "Either Socrates is wise or Plato is foolish" is an alternative proposition and not one with a subject or predicate. But to this someone may make the following objection: In such a proposition we can take any term we please, say Socrates, to be the subject. The predicate will then be "being wise unless Plato is foolish" or the propositional function " \hat{x} is wise, or Plato is foolish". The phrase "being wise unless Plato is foolish" will then stand for a complex universal which is asserted to characterise Socrates. Such a view, though very frequently held, seems to me nevertheless certainly mistaken. In order to make things clearer let us take a simpler case, a proposition of the form " aRb "; then this theory will hold that there are three closely related propositions; one asserts that the relation R holds between the terms a and b , the second asserts the possession by a of the complex property of "having R to b ,"

while the third asserts that b has the complex property that a has R to it. These must be three different propositions because they have different sets of constituents, and yet they are not three propositions, but one proposition, for they all say the same thing, namely that a has R to b . So the theory of complex universals is responsible for an incomprehensible trinity, as senseless as that of theology. This argument can be strengthened by considering the process of definition, which is as follows. For certain purposes " aRb " may be an unnecessarily long symbol, so that it is convenient to shorten it into ϕb . This is done by definition, $\phi x = aRx$, signifying that any symbol of the form ϕx is to be interpreted as meaning what is meant by the corresponding symbol aRx , for which it is an abbreviation. In more complicated cases such an abbreviation is often extremely useful, but it could always be dispensed with if time and paper permitted. The believer in complex universals is now confronted with a dilemma; is " ϕ ," thus defined, a name for the complex property of x which consists in a having R to x ? If so, then ϕx will be the assertion that x has this property; it will be a subject-predicate proposition whose subject is x and predicate ϕ ; which is not identical with the relational proposition aRx . But as ϕx is by hypothesis defined to be short for aRx this is absurd. For if a definition is not to be interpreted as signifying that the definiendum and definiens have the same meaning, the process of definition becomes unintelligible and we lose all justification for interchanging definiens and definiendum at will, on which depends its whole utility. Suppose on the other hand " ϕ ," as defined above, is not a name for the complex property; then how can the complex property ever become an object of our contemplation, and how can we ever speak of it, seeing that " ϕ ," its only possible name, is not a name for it at all but short for something else? And then what reason can there be to postulate the existence of this thing?

In spite of this *reductio ad absurdum* of the theory, it may still be worth while to inquire into its origin, and into why it is held by so many people, including formerly myself, without its occurring to them to doubt it. The chief reason for this is I think to be found in linguistic convenience; it gives us one object which is "the meaning" of " ϕ ". We often want to talk of "the meaning of ' ϕ '" and it is simpler to suppose that this is a unique object, than to recognise that it is a much more complicated matter, and that " ϕ " has a relation of meaning not to one complex object but to the several simple objects, which are named in its definition.

There is, however, another reason why this view is so popular, and that is the imaginary difficulty which would otherwise be felt in the use of a variable propositional function. How, it might be asked, are we to interpret such a statement as "*a* has all the properties of *b*," except on the supposition that there are properties? The answer is that it is to be interpreted as being the logical product of all propositions which can be constructed in the following way; take a proposition in which *a* occurs, say ϕa , change *a* into *b* and obtain ϕb , and then form the proposition $\phi b \cdot \supset \cdot \phi a$. It is not really quite so simple as that, but a more accurate account of it would involve a lot of tiresome detail, and so be out of place here; and we can take it as a sufficient approximation that "*a* has all the properties of *b*" is the joint assertion of all propositions of the form $\phi b \cdot \supset \cdot \phi a$, where there is no necessity for ϕ to be the name of a universal, as it is merely the rest of a proposition in which *a* occurs. Hence the difficulty is entirely imaginary. It may be observed that the same applies to any other case of apparent variables some of whose values are incomplete symbols, and this may explain the tendency to assert that some of Mr. Russell's incomplete symbols are not really incomplete but the names of properties or predicates.

I conclude, therefore, that complex universals are to be rejected; and that such a proposition as "either Socrates is wise or Plato foolish" has neither subject nor predicate. Similar arguments apply to any compound proposition, that is any proposition containing such words as "and", "or", "not", "all", "some"; and hence if we are to find a logical distinction between subject and predicate anywhere it will be in atomic propositions, as Mr. Russell calls them, which could be expressed by sentences containing none of the above words, but only names and perhaps a copula.

The distinction between subject and predicate will then arise from the several names in an atomic proposition functioning in different ways; and if this is not to be a purely grammatical distinction it must correspond to a difference in the functioning of the several objects in an atomic fact, so that what we have primarily to examine is the construction of the atomic fact out of its constituents. About this three views might be suggested; first there is that of Mr. Johnson according to whom the constituents are connected together by what he calls the characterising tie. The nature of this entity is rather obscure, but I think we can take it as something which is not a constituent of the fact, but represented in language by the copula "is"; and we can describe this

theory as holding that the connexion is made by a real copula. Next there is the theory of Mr. Russell that the connexion is made by one of the constituents; that in every atomic fact there must be one constituent which is in its own nature incomplete or connective and, as it were, holds the other constituents together. This constituent will be a universal, and the others particulars. Lastly there is Mr. Wittgenstein's theory that neither is there a copula, nor one specially connective constituent, but that, as he expresses it, the objects hang one in another like the links of a chain.

From our point of view, it is the second of these theories that demands most attention; for the first and third do not really explain any difference in the mode of functioning of subject and predicate, but leave this a mere dogma. Only on Mr. Russell's theory will there be an intelligible difference between particular and universal, grounded on the necessity for there to be in each fact a copulating term or universal, corresponding to the need for every sentence to have a verb. So it is Mr. Russell's theory that we must first consider.

The great difficulty with this theory lies in understanding how one sort of object can be specially incomplete. There is a sense in which any object is incomplete; namely that it can only occur in a fact by connexion with an object or objects of suitable type; just as any name is incomplete, because to form a proposition we have to join to it certain other names of suitable type. As Wittgenstein says: "The thing is independent, in so far as it can occur in all *possible* circumstances, but this form of independence is a form of connexion with the atomic fact, a form of dependence. (It is impossible for words to occur in two different ways, alone and in the proposition)." And Johnson "ultimately a universal means an adjective that may characterise a particular, and a particular means a substantive that may be characterised by a universal." Thus we may admit that "wise" involves the form of a proposition, but so does "Socrates," and it is hard to see any ground for distinguishing between them. This is the substance of Mr. Johnson's criticism, that Mr. Russell will not let the adjective stand alone, and in treating "*s* is *p*" as a function of two variables takes the arguments to be not *s* and *p*, but *s* and "*x* is *p*".

In reply to this criticism Mr. Russell would, I imagine, use two lines of argument, whose validity we must examine. The first would dwell on the great convenience in mathematical logic of his functional symbolism, of which he might say there was no explanation except that this symbolism corresponded to reality more closely than any other. His

second line of argument would be that everyone can feel a difference between particulars and universals; that the prevalence of nominalism showed that the reality of universals was always suspected, and that this was probably because they did in fact differ from particulars by being less independent, less self-contained. Also that this was the only account of the difference between particulars and universals, which made them really different kinds of objects, as they evidently were, and not merely differently related to us or to our language. For instance, Mr. Johnson describes the particular as presented to thought for its character to be determined in thought, and others might say a particular was what was meant by the grammatical subject of a sentence; and on these views what was particular, what universal would depend on unessential characteristics of our psychology or our language.

Let us take these lines of argument in reverse order, beginning with the felt difference between particular and universal, and postponing the peculiar symbolic convenience of propositional functions. Anyone, it may be said, sees a difference between Socrates and wisdom. Socrates is a real independent entity, wisdom a quality and so essentially a quality of something else. The first thing to remark about this argument, is that it is not really about objects at all. "Socrates is wise" is not an atomic proposition, and the symbols "Socrates" and "wise" are not the names of objects but incomplete symbols. And according to Wittgenstein, with whom I agree, this will be the case with any other instances that may be suggested, since we are not acquainted with any genuine objects or atomic propositions, but merely infer them as presupposed by other propositions. Hence the distinction we feel is one between two sorts of incomplete symbols, or logical constructions, and we cannot infer without further investigation that there is any corresponding distinction between two sorts of names or objects.

We can, I think, easily obtain a clearer idea of the difference between these two sorts of incomplete symbols (Wittgenstein calls them "expressions") typified by "Socrates" and "wise". Let us consider when and why an expression occurs, as it were, as an isolated unit. For instance " aRb " does not naturally divide into " a " and " Rb ," and we want to know why anyone should so divide it, and isolate the expression " Rb ". The answer is that if it were a matter of this proposition alone, there would be no point in dividing it in this way, but that the importance of expressions just arises, as Wittgenstein points out, in connexion with generalisation. It is not " aRb " but " $(x).xRb$ " which makes Rb prominent.

In writing $(x).xRb$ we use the expression Rb to collect together the set of propositions xRb , which we want to assert to be true; and it is here that the expression Rb is really essential because it is that which is common to this set of propositions. If now we realise that this is the essential use of expressions, we can see at once what is the difference between Socrates and wise. By means of the expression "Socrates" we collect together all the propositions in which it occurs, that is, all the propositions which we should ordinarily say were about Socrates, such as "Socrates is wise," "Socrates is just," "Socrates is neither wise nor just". These propositions are collected together as the values of " ϕ Socrates," where ϕ is a variable.

Now consider the expression "wise"; this we use to collect together the propositions "Socrates is wise," "Plato is wise," and so on, which are values of " x is wise". But this is not the only collection we can use "wise" to form; just as we used "Socrates" to collect all the propositions in which it occurred, we can use "wise" to collect all those in which it occurs, including not only ones like "Socrates is wise" but also ones like "neither Socrates nor Plato is wise," which are not values of " x is wise," but only of the different function " ϕ wise," where ϕ is variable. Thus whereas Socrates gives only one collection of propositions, wise gives two; one analogous to that given by Socrates, namely the collection of all propositions in which wise occurs; and the other a narrower collection of propositions of the form " x is wise".

This is obviously the explanation of the difference we feel between Socrates and wise, which Mr. Russell expresses by saying that with wise you have to bring in the form of a proposition. Since all expressions must be completed to form a proposition, it was previously hard to understand how wise could be more incomplete than Socrates. Now we can see that the reason for this is that whereas with "Socrates" we only have the idea of completing it in any manner into a proposition, with "wise" we have not only this but also an idea of completing it in a special way, giving us not merely any proposition in which wise occurs but one in which it occurs in a particular way, which we may call its occurrence as predicate, as in "Socrates is wise".

What is this difference due to? and is it a real difference at all? That is to say, can we not do with "Socrates" what we do with "wise" and use it to collect a narrower set of propositions than the whole set in which it occurs? Is this impossible? or is it merely that we never in fact do it? These are the questions we must now try to answer. The

way to do it would seem to be the following. Suppose we can distinguish among the properties of Socrates a certain subset which we can call qualities; the idea being roughly that only a simple property is a quality. Then we could form in connexion with "Socrates" two sets of propositions just as we can in connexion with "wise". There would be the wide set of propositions, in which "Socrates" occurs at all, which we say assert properties of Socrates, but also there would be the narrower set which assert qualities of Socrates. Thus supposing justice and wisdom to be qualities, "Socrates is wise," "Socrates is just" would belong to the narrower set and be values of a function "Socrates is q ". But "Socrates is neither wise nor just" would not assert a quality of Socrates but only a compound characteristic or property, and would only be a value of the function " ϕ Socrates," not of "Socrates is q ".

But although such a distinction between qualities and properties may be logically possible, we do not seem ever to carry it out systematically. Some light may be thrown on this fact by a paragraph in Mr. Johnson's logic in which he argues that whereas "we may properly construct a compound adjective out of simple adjectives, yet the nature of any term functioning as substantive is such that it is impossible to construct a genuine compound substantive". Thus from the two propositions "Socrates is wise," "Socrates is just" we can form the proposition "Neither is Socrates wise, nor is Socrates just" or, for short, "Socrates is neither wise nor just"; which still, according to Mr. Johnson, predicates an adjective of Socrates, is a value of " ϕ Socrates" and would justify " $(\exists \phi) . \phi$ Socrates," or "Socrates has some property". If, on the other hand, we take the two propositions "Socrates is wise," "Plato is wise" and form from them "Neither Socrates is wise nor Plato is wise"; this is not a value of " x is wise" and would not justify " $(\exists x) . x$ is wise," or "some-one is wise". So in as much as "Socrates is neither wise nor just" justifies "Socrates has some adjective" we can say that "neither wise nor just" is a compound adjective; but since "Neither Socrates nor Plato is wise" does not justify "something is wise," "neither Socrates nor Plato" cannot be a compound substantive, any more than nobody is a compound man.

If, however, we could form a range of qualities, as opposed to properties, "Socrates is neither wise nor just" would not justify "Socrates has some quality" and "neither wise nor just" would not be a quality. Against this Mr. Johnson says that there is no universally valid criterion by which we

can distinguish qualities from other properties; and this is certainly a very plausible contention, when we are talking, as we are now, of qualities and properties of logical constructions such as Socrates. For the distinction is only really clear in connexion with genuine objects; then we can say that ϕ represents a quality when ϕa is a two termed atomic proposition, and this would distinguish qualities from other propositional functions or properties. But when the subject a is a logical construction and ϕa a compound proposition of which we do not know the analysis, it is hard to know what would be meant by asking if ϕ were simple, and calling it, if simple, a quality. It would clearly have to be a matter not of absolute but of relative simplicity.

Yet it is easy to see that, in theory, an analogous distinction can certainly be made for incomplete symbols also. Take any incomplete symbol " a "; this will be defined not in isolation but in conjunction with any symbol of a certain sort x . Thus we might define ax to mean aRx . Then this incomplete symbol " a " will give us two ranges of propositions, the range ax obtained by completing it in the way indicated in its definition; and the general range of propositions in which a occurs at all, that is to say all truth functions of the propositions of the preceding range and constant propositions not containing a . Thus in the two famous cases of descriptions and classes, as treated in *Principia Mathematica*, the narrower range will be that in which the description or class has primary occurrence, the wider range that in which it has any sort of occurrence primary or secondary, where the terms "primary" and "secondary" occurrence have the meanings explained in *Principia*. In brief with regard to any incomplete symbol we can distinguish its primary and secondary occurrences, and this is fundamentally the same distinction which we found to be characteristic of the adjective. So that any incomplete symbol is really an adjective, and those which appear substantives only do so in virtue of our failing whether through inability or neglect to distinguish their primary and secondary occurrences. As a practical instance let us take the case of material objects; these we are accustomed to regard as substantives, that is to say we use them to define ranges of propositions in one way only, and make no distinction between their primary and secondary occurrences. At least no one made such a distinction until Dr. Whitehead declared that material objects are adjectives of the events in which they are situated, so that the primary occurrence of a material object A is in a proposition " A is situated in E ." From such propositions as this we can construct all other

propositions in which *A* occurs. Thus "*A* is red" will be "for all *E*, *A* is situated in *E* implies redness is situated in *E*," in which *A* has secondary occurrence. So the distinction between primary and secondary occurrence is not merely demonstrated as logically necessary, but for this case effected practically.

The conclusion is that, as regards incomplete symbols, the fundamental distinction is not between substantive and adjective but between primary and secondary occurrence; and that a substantive is simply a logical construction between whose primary and secondary occurrences we fail to distinguish. So that (to be a substantive is not an objective but a subjective property, in the sense that it depends not indeed on any one mind but on the common elements in all men's minds and purposes.)

This is my first conclusion, which is I think of some importance in the philosophy of nature and of mind, but it is not the conclusion which I most want to stress, and it does not answer the question with which I began my paper. For it is a conclusion about the method and possibility of dividing certain logical constructions into substantives and adjectives, it being in connection with these logical constructions that the idea of substantive and adjective traditionally originated. But the real question at issue is the possibility of dividing not logical constructions but genuine objects into particulars and universals, and to answer this we must go back and pick up the thread of the argument, where we abandoned it for this lengthy digression about logical constructions.

We saw above that the distinction between particular and universal was derived from that between subject and predicate, which we found only to occur in atomic propositions. We then examined the three theories of atomic propositions or rather of atomic facts, Mr. Johnson's theory of a tie, Mr. Russell's that the copulation was performed by universals, of which there must be one and only one in each atomic fact, and Mr. Wittgenstein's that the objects hung in one another like the links of a chain. We observed that of these theories only Mr. Russell's really assigned a different function to subject and predicate and so gave meaning to the distinction between them, and we proceeded to discuss this theory. We found that to Mr. Johnson's criticisms Mr. Russell had two possible answers; one being to argue that his theory alone took account of the difference we feel there to be between Socrates and wisdom, the other that his notation was far more convenient than any other, and must therefore correspond more closely to the facts. We then took the first of

these arguments, and examined the difference between Socrates and wise. This we found to consist in the fact that whereas Socrates determined only one range of propositions in which it occurred, wise determined two such ranges, the complete range "*f* wise," and the narrower range "*x* is wise". We then examined the reason for this difference between the two incomplete symbols Socrates and wise, and decided that it was of a subjective character and depended on human interests and needs.

What we have now to consider is whether the difference between Socrates and wise, has any such bearing on the composition of atomic facts, as Mr. Russell alleges it to have. This we can usefully combine with the consideration of Mr. Russell's other possible argument from the superior convenience of his symbolism. The essence of this symbolism, as Mr. Johnson has observed, consists in not letting the adjective stand alone, but making it a propositional function by attaching to it a variable *x*. A possible advantage of this procedure at once suggests itself in terms of our previous treatment of the difference between substantive and adjective; namely that attaching the variable *x* helps us to make the distinction we require to make in the case of the adjective, but not in the case of the substantive, between the values of ϕx , and those of $f(\phi^2)$ where *f* is variable. Only so, it might be said, can we distinguish $(x) \cdot \phi x$ from $(f) \cdot f(\phi^2)$. But very little consideration is required to see that this advantage is very slight and of no fundamental importance. We could easily make the distinction in other ways; for instance by determining that if the variable came after the ϕ it should mean what we now express by ϕx , but if before the ϕ what we express by $f(\phi^2)$; or simply by deciding to use the letters "*x*," "*y*," "*z*," in one case, "*f*," "*g*," "*h*," in the other.

But, although this supposed advantage in the functional symbolism is imaginary, there is a reason which renders it absolutely indispensable. Take such a property as "either having *R* to *a*, or having *S* to *b*"; it would be absolutely impossible to represent this by a simple symbol " ϕ ". For how then could we define ϕ ? We could not put $\phi = Ra \cdot v \cdot Sb$ because we should not know whether the blanks were to be filled with the same or different arguments, and so whether ϕ was to be a property or relation. Instead we must put $\phi x = xRa \cdot v \cdot xSb$; which explains not what is meant by ϕ by itself but that followed by any symbol *x* it is short for $xRa \cdot v \cdot xSb$. And this is the reason which makes inevitable the introduction of propositional functions. It simply means that in such a case " ϕ " is not a name but an incom-

plete symbol and cannot be defined in isolation or allowed to stand by itself.)

But this conclusion about xRa . v. xSb will not apply to all propositional functions. (If ϕa is a two termed atomic proposition, " ϕ " is a name of the term other than a , and can perfectly well stand by itself; so, it will be asked, why do we write " ϕx " instead of " ϕ " in this case also? The reason for this lies in a fundamental characteristic of mathematical logic, its extensionality, by which I mean its primary interest in classes and relations in extension. Now if in any proposition whatever we change any individual name into a variable, the resulting propositional function defines a class; and the class may be the same for two functions of quite different forms, in one of which " ϕ " is an incomplete symbol, in the other a name. So mathematical logic being only interested in functions as a means to classes, sees no need to distinguish these two sorts of functions, because the difference between them, though all-important to philosophy, will not correspond to any difference between the classes they define. So, because some ϕ 's are incomplete and cannot stand alone, and all ϕ 's are to be treated alike in order to avoid useless complication, the only solution is to allow none to stand alone.)

Such is the justification of Mr. Russell's practice; but it is also the refutation of his theory, which fails to appreciate the distinction between those functions which are names and those which are incomplete symbols, a distinction which, as remarked above, though immaterial for mathematics is essential for philosophy. I do not mean that Mr. Russell would now deny this distinction; on the contrary, it is clear from the second edition of *Principia* that he would accept it; but I think that his present theory of universals is the relic of his previous failure to appreciate it.

It will be remembered that we found two possible arguments for his theory of universals. One was from the efficiency of the functional notation; this clearly lapses because, as we have seen, the functional notation merely overlooks an essential distinction which happens not to interest the mathematician, and the fact that some functions cannot stand alone is no argument that all cannot. The other argument was from the difference we feel between Socrates and wise, which corresponds to a difference in his logical system between individuals and functions. Just as Socrates determines one range of propositions, but wise two, so a determines the one range ϕa , but ϕ^2 the two ranges ϕx , and $f(\phi^2)$. But what is this difference between individuals and functions due to? Again, simply to the fact

that certain things do not interest the mathematician. Anyone who was interested not only in classes of things, but also in their qualities, would want to distinguish from among the others, those functions which were names; and if we called the objects of which they are names qualities, and denoted a variable quality by q , we should have not only the range ϕa , but also the narrower range qa and the difference analogous to that between "Socrates" and "wisdom" would have disappeared. We should have complete symmetry between qualities and individuals; each could have names which could stand alone, each would determine two ranges of propositions, for a would determine the ranges qa and ϕa , where q and ϕ are variables, and q would determine the ranges qx and $f q$, where x and f are variables.

So were it not for the mathematician's biased interest he would invent a symbolism which was completely symmetrical as regards individuals and qualities; and it becomes clear that there is no sense in the words individual and quality; — all we are talking about is two different types of objects, such that two objects, one of each type, could be sole constituents of an atomic fact. The two types being in every way symmetrically related, nothing can be meant by calling one type the type of individuals and the other that of qualities, and these two words are devoid of connotation.

To this, however, various objections might be made which must be briefly dealt with. First it might be said that the two terms of such an atomic fact must be connected by the characterising tie and/or the relation of characterisation, which are asymmetrical, and distinguish their relata into individuals and qualities. Against this I would say that the relation of characterisation is simply a verbal fiction. " q characterises a " means no more and no less than " a is q ," it is merely a lengthened verbal form; and since the relation of characterisation is admittedly not a constituent of " a is q " it cannot be anything at all. As regards the tie, I cannot understand what sort of a thing it could be, and prefer Wittgenstein's view that in the atomic fact the objects are connected together without the help of any mediator. This does not mean that the fact is simply the collection of its constituents but that it consists in their union without any mediating tie. There is one more objection suggested by Mr. Russell's treatment in the new edition of *Principia*. He there says that all atomic propositions are of the forms $R_1(x)$, $R_2(x, y)$, $R_3(x, y, z)$ etc., and can so define individuals as terms which can occur in propositions with any number of terms; whereas of course an n -termed relation could only occur in a proposition with $n + 1$ terms.

But this assumes his theory as to the constitution of atomic facts, that each must contain a term of a special kind, called a universal; a theory we found to be utterly groundless. The truth is that we know and can know nothing whatever about the forms of atomic propositions; we do not know whether some or all objects can occur in more than one form of atomic proposition; and there is obviously no way of deciding any such question. We cannot even tell that there are not atomic facts consisting of two terms of the same type. It might be thought that this would involve us in a vicious circle contradiction, but a little reflection will show that it does not, for the contradictions due to letting a function be its own argument only arise when we take for argument a function containing a negation, which is therefore an incomplete symbol not the name of an object.

In conclusion let us describe from this new point of view the procedure of the mathematical logician. He takes any type of objects whatever as the subject of his reasoning, and calls them individuals, meaning by that simply that he has chosen this type to reason about, though he might equally well have chosen any other type and called them individuals. The results of replacing names of these individuals in propositions by variables he then calls functions, irrespective of whether the constant part of the function is a name or an incomplete symbol, because this does not make any difference to the class which the function defines. The failure to make this distinction has led to these functional symbols, some of which are names and some incomplete, being treated all alike as names of incomplete objects or properties, and is responsible for that great muddle the theory of universals. Of all philosophers Wittgenstein alone has seen through this muddle and declared that about the forms of atomic propositions we can know nothing whatever.

II.—ON MR. BROAD'S THEORY OF TIME.

BY R. M. BLAKE.

THE following is a criticism of the theory of time advocated by Mr. Broad in the second chapter of his recent work on *Scientific Thought*. In opposition to Mr. Broad I would myself defend a theory which is in all essentials that expounded by Mr. Russell in his paper *On the Experience of Time* (*The Monist*, 1915). The most distinctive feature of Mr. Broad's theory is his doctrine of the *complete nonentity of the future*. He does not merely mean that, just as the events of the past are no longer happening *now*, so the events of the future are not happening *as yet*, for he admits that the events of the past, though past, nevertheless *exist* (cf. p. 69). But although he holds that in a sense "the past is thus as real as the present" (p. 66), he tells us on the contrary that "the future is simply nothing at all" (p. 66). This theory is one which leads to very uncomfortable and paradoxical conclusions. As Mr. Broad himself candidly points out, if we accept his view of the matter we must be prepared to admit either that judgments which refer to the future are neither true nor false (*i.e.*, that the Law of Excluded Middle is not true without exception), or that so-called "judgments" which profess to be about the future are not really judgments at all (cf. p. 73). Either of these consequences is certainly decidedly unappetising. It must be conceded that Mr. Broad has worked out this type of theory in a highly ingenious manner, and, in default of anything better, I suppose that we should be obliged to accept it. But it is a sort of theory to which Mr. Broad himself seems to be reluctantly driven by what he considers to be the necessities of the situation, rather than one which he would spontaneously have adopted.

In what follows I hope to establish three principal points. First of all, I wish to show that Mr. Broad's theory of the nonentity of the future and the definitions which he bases upon it, even if true, are not in the least necessary, as Mr. Broad appears to suppose, in order that we should be able to understand what is meant by earlier and later, past and

present, in the succession of events. Secondly, I wish to show that Mr. Broad's own definitions of "present," and correlatively of "past" and "future," are susceptible of several quite different interpretations; and, moreover, that, whichever of these interpretations we adopt, we are led either (1) to conclusions wholly out of accord both with the rest of Mr. Broad's own views and with the generally admitted facts, or (2) to a view of the nature of the distinction between past, present, and future which, though true, and indeed, so far as it goes, identical with our own, nevertheless (a) is not in the slightest degree dependent upon or derived from Mr. Broad's theory of the nonentity of the future, and (b) supplies no adequate answer to the problems involved. Finally, I wish to show that the difficulties which Mr. Broad alleges against a theory of the type advocated by Mr. Russell do not in fact exist, and that such a theory, while avoiding the paradoxes of Mr. Broad's doctrine, supplies satisfactory solutions to just those problems which Mr. Broad simply leaves untouched.

I.

According to Mr. Broad, the reason why it is necessary to accept his view concerning the nature of past, present and future is that in terms of this theory alone is it possible for us to understand the peculiar nature of time. The most characteristic fact about the time-series is that referred to by such common statements as that "time flows in one direction" or "time cannot flow backwards." As Mr. Broad puts it, "The peculiarity of a series of events in Time is that it has not only an intrinsic *order* but also an intrinsic *sense*" (p. 57). It is in this that a temporal series most notably differs from a spatial series. "Three points on a straight line have an intrinsic order, *i.e.*, B is between A and C, or C is between B and A, or A is between C and B. This order is independent of any tacit reference to something traversing the line in a certain direction" (p. 57). But "the points on a straight line do not have an intrinsic sense" (p. 57). To say that a series has an intrinsic sense means that given any two of the elements composing the series (say A and B) there is *without reference to anything extraneous to the series itself* some determinate answer to the question "does A come before B, or B before A?" Now there is no such intrinsic sense in the case of the points on a line. "A sense is only assigned to them by correlation with the left and right of an imaginary observer, or by thinking of a moving body

traversing the line in such a way that its presence at A is earlier than its presence at C" (p. 57). The case of a temporal series is, however, very different. The sense of the series is here intrinsic. One event, without any reference to anything outside the series of events itself, is always either earlier or later than any other (unless the two be simultaneous). The series does not gain this sense by correlation with something which moves along it. Events in time, wholly apart from any such reference, succeed one another in a determinate and fixed direction. So far there is no doubt that Mr. Broad's account of the matter is quite correct.

But now, according to his view, "the intrinsic sense of a series of events in Time is essentially bound up with the distinction between past, present and future. A precedes B because A is past when B is present" (p. 58). Whether we say that A precedes B or that A is past when B is present, we are in any case referring to one and the same fact, and it appears to be Mr. Broad's belief that we can only understand what is meant by saying either that A is "earlier than" or "later than" B or that A is "past" when B is "present," in the light of the definitions of these various terms provided by his theory. What I maintain is, on the contrary, that without the slightest reference to the question of the nonentity of the future or to the definitions of past, present and future based upon it, we can and do gain an understanding of the meaning of earlier and later from the *data of immediate experience*, whilst past and present, so far as they are bound up with the intrinsic sense of time, can be defined in terms of these elementary temporal relations. Mr. Broad himself admits that we have immediate experience of the succession of events in time. He gives considerable prominence to the phenomenon known as the "specious present," that is to say, as he himself expresses it (p. 348) "A sensible event has a finite duration, . . ." and again (p. 348): "it is certain that what can be sensed at any moment stretches a little way back behind that moment". In other words, within what we immediately experience there is already present the character of succession, *i.e.*, one part of the immediately experienced datum is earlier than the other. And if one part of the experienced datum is earlier than the other, that is as much as to say that it possesses an intrinsic sense—that the succession takes place in a single fixed direction. But now, if it be true that we have an immediate experience of the intrinsic order and intrinsic sense of a series of events in time, then *on the basis of this immediate experience alone* we can understand what it means for one event to be earlier

or later than another. It means simply that events are related in the peculiar way in which when we experience their succession we *find* them to be related.

Mr. Broad appears to suppose that his elaborate theory of the nonentity of the future is necessary in order that in terms of that theory we may *define* the relations of earlier and later, and thus come to understand what we mean by saying that one event is earlier or later than another. But as a matter of fact earlier and later are simply names which we give to certain relations which we *find* in *immediate experience*. No definition of these words is necessary, nor is any theory required to make them intelligible. Whether the future is in any sense real or not is a matter of theory, but the intrinsic order and sense of a series of events in time are matters of experience. The nonentity of the future is certainly not a fact of immediate experience; and it can therefore not be necessary that we should accept a theory of time based upon it before we can understand that the series of events in time possesses the intrinsic sense which we experience within it. We can identify one event as earlier or later than another without knowing anything of Mr. Broad's theory of the nonentity of the future, or of the definitions of earlier and later which he bases upon it. The latter are therefore not required in order to make this distinction intelligible.

On the other hand, if all we knew of the relation of earlier and later were what is contained in Mr. Broad's theory and the definitions based upon it we should never be able to identify *any* event as earlier or later than any other. His definition of earlier and later is as follows: "A moment t is later than a moment t' if the sum total of existence at t includes the sum total of existence at t' together with something more". If this were all we knew about the meaning of earlier and later we should certainly not be able to say which of two events was the earlier, for in order to do so we should be obliged to compare the "sum total of existence" at the time when the one event occurs with the "sum total of existence" at the time when the other event occurs, and any such comparison obviously cannot be made. But although we *cannot* make any such comparison as would be here required, the fact of the matter is that we *can* and often *do* know which of two events is the earlier. Mr. Broad's position is really very peculiar. He holds most distinctly that a series of events *does* have an intrinsic sense, and protests most vigorously against those who, holding that a series of events has an intrinsic order but no intrinsic sense, assume that "It gains a sense, and we become able to talk of one event as

earlier than another, and not merely of one event as between two others, because the attribute of presentness *moves* along the series in a fixed direction" (p. 60). But he himself seems often to argue as if the "sense" of time were not intrinsic but derivative—as, for example, when he states that "The sum total of existence is always increasing, and it is this which gives the time-series a sense as well as an order" (pp. 66-67). He thus appears to hold that the succession of events in time with their intrinsic sense is a datum of immediate experience *and also* that we cannot understand what is meant by saying that one event is earlier or later than another without the aid of his theory concerning the meta-physical status of past, present and future.

But now, once we have grasped the meaning of earlier and later as these are immediately experienced we can hereupon define the meaning of past, present and future, so far as these are bound up with the intrinsic sense of a series of events in time. When an event is said to be present at a given time this means that it *occurs* at that time, and neither earlier nor later. When an event is said to be past at a given time this means that it occurs earlier than anything that is occurring at the given time. When an event is said to be future at a given time this means that it occurs later than anything that is occurring at the given time. It is evident that no reference to the theory of the nonentity of the future is involved in these definitions.

II.

We now pass to the consideration of our second main point. When we come to examine Mr. Broad's own proposed definition of the meaning of "present," and correlatively of past and future, it turns out to be rather unmanageable. In fact it is difficult even to see what Mr. Broad may have *meant* by his definition. He tells us that "a present event is defined as one that is succeeded by nothing." No less than *five* possible interpretations of his meaning must here be considered.

(1) At first sight Mr. Broad *seems* here to mean that a present event is one which is *never* to have a successor. But nevertheless I think this can scarcely be what he really does mean. For I find it very difficult to believe that Mr. Broad would be willing to accept the consequences of such an interpretation. On this interpretation, taken together with the rest of his theory, it would of course follow, first of all, that the events of the present are actually going to have no

successors, and that the history of the world is therefore now forever terminated. It would also follow, secondly, that no event of the past has ever been present. And it would follow, in the third place, either (a) that there are not now and never have been any present events at all, or (b) that most, if not all, of the events of the past are actually now present.

The first of this last pair of consequences would be reached as the result of the following course of reasoning. Mr. Broad holds that every actual event has some duration, in fact he defines the term event in terms of duration: "By an *event* I am going to mean anything that endures at all, no matter how long it lasts or whether it be qualitatively alike or qualitatively different at adjacent stages in its history" (p. 54). And he also holds that if an event lasts for a finite time it "is divisible into earlier and later parts which together make it up" (p. 353, *cf.* p. 352), and which are themselves events of shorter duration. To be sure, he also tells us (p. 69) that "events short enough to fall in Specious Presents become as wholes"; but this can scarcely be intended to mean that they "become as wholes" in such a way that their duration is not a duration at all, but a simultaneity. But now, if every event has thus an earlier and a later section, the earlier section surely cannot itself be said to be "present," for it is not, in the present interpretation of the phrase, "succeeded by nothing". Moreover, the later section of our original event is, of course, itself also an event having an earlier and a later section, and again, the earlier of *these* cannot, on the present interpretation, be said to be "present". In fact, it is evident that, no matter how long we continue this process, we shall never arrive at any event or section of an event the whole of which can be present. The only section of an event which could in this sense be "succeeded by nothing," and thus really be present, would be a strictly instantaneous section, *i.e.*, a section having no duration at all. And, of course, Mr. Broad does not believe that every event is composed of two sections, the earlier of which has a finite duration and is, therefore, not capable of being present, and the later of which, although capable of being present, has no duration at all. On this interpretation, it would appear that only the last instantaneous section of any event could ever be present; but Mr. Broad makes it quite clear that he does not believe that any event really has any last instantaneous section.

One further point might, however, here be raised. It might be suggested, namely, that we are neglecting the fact

of the *minimum sensible* in the way of duration. It would probably be generally admitted that there are events so short that we experience them only as wholes, *i.e.*, that we can distinguish within them no earlier and no later section. And it might perhaps be thought that this fact makes it possible to find an event which could be, in the present sense of the term, a "present" event. For there might be some such *minimum sensible* which would literally be succeeded by nothing at all. The difficulty would not, however, be thus removed. For, however much it may be true that in the experience of a *minimum sensible* we *distinguish* within it no earlier and no later section, it can scarcely be denied, and at any rate Mr. Broad would apparently not deny, that even the *minimum sensible* is after all an event of *some* duration, and that there must therefore *be* within it an earlier and a later section. And if this be the case, the difficulty would still remain unremedied.

There is, however, a way in which this difficulty might possibly be avoided, but only, as we shall see, by leading us to even more uncomfortable conclusions. It might possibly be replied that we must consider events as *wholes* and that there may quite well be events which as wholes are in our present sense of the term "succeeded by nothing," and thus genuinely present. But if there be *any* event which is thus present, it would seem that there must be a very great many events all of which are present—in fact all *too* many. For consider any event which occurred at a time earlier than the time of the occurrence of any event which is in this sense present, and such that other events have in such wise filled the time between the earlier event and the given present event that no gap of empty time (supposing such a thing to be possible) shall have intervened between them. This series of events, beginning with the earlier event in question and ending with the given present event, will then constitute a whole which will itself be an event, for Mr. Broad himself assures us that by an event he means "anything that endures at all, no matter how long it lasts or whether it be qualitatively alike or qualitatively different at adjacent stages in its history" (p. 54). And furthermore this very long event will as a whole conform to Mr. Broad's definition of a "present" event, in the way in which we are just now interpreting that definition. Thus we have managed to escape the conclusion that there can be *no* present events only by employing a consideration which leads to the equally repugnant conclusion that every event which occurred at a time previous to any given present event, and would therefore usually be said to be "past," is

really (unless some empty time intervene between it and the given "present" event) only the earlier section of an event the whole of which is now present—and this is the second of the pair of alternatives mentioned above. Such a conclusion would certainly invest such common phrases as "the present hour," "the present day," "the present year," "the present century," "the present time-order," etc., with a hideously literal significance. And I can scarcely suppose it to be intended by Mr. Broad.

I may here point out, however, that this particular difficulty would have been avoided if Mr. Broad had introduced some limitation of time into his definition. He might, that is, have defined a "present" event as one "succeeded by nothing *and also* not more than so many minutes or seconds long". And it would be natural to suggest, if one were looking for such a qualification, that we might regard the length of the specious present as a reasonable limitation here to be imposed. But in so far as the "present" is so defined as to limit its duration to the length of the specious present the definition is obviously moving in the direction of a theory which, like that of Mr. Russell, tries to "resolve the differences between past, present, and future into differences in the cognitive relations of our minds to different events. . ." (p. 60). Such a theory would, however, be rejected by Mr. Broad, inasmuch as he (mistakenly) supposes it to be connected with the theory that the time-series has an intrinsic order but no intrinsic sense. And at any rate, so long as it is still made a part of the definition of a "present" event that it is, in the sense of the term which we are now considering, "succeeded by nothing," the definition would still lead to the two first very uncomfortable conclusions mentioned above. I can hardly suppose, then, that we have as yet succeeded in penetrating Mr. Broad's meaning.

(2) Perhaps, however, it may be that when he defines a present event as one which is "succeeded by nothing," he does not mean that it is an event which is *never* to have a successor, but rather that it is an event which *at the time at which it occurs* has been succeeded by nothing *as yet*. But, unfortunately, *every* event at the time at which it occurs has been succeeded by nothing as yet, and it would therefore appear that, according to this interpretation of the matter, there could be no past events at all. Mr. Broad does not, however, appear to accept this conclusion. In fact, he at least intends to hold that events may in some sense cease to be present and become past (*cf.* p. 66). Let us therefore inquire what, in accordance with our present interpretation,

might be meant by a "past" event. If a "present" event is one which is "succeeded by nothing," a "past" event would correlatively, I suppose, be one which is "succeeded by something". If, however, we were hereupon to give to the expression "succeeded by something" an interpretation analogous to the interpretation which we are at present giving to the expression "succeeded by nothing," we should find ourselves defining a "past" event as one which at the time at which it occurs has already a successor. This, obviously, if there are to be any past events at all, cannot be correct; for no event can, at the time of its occurrence, already have been followed by some other event. It must rather be meant that a "past" event is one which at some time later than that of its occurrence has a successor. But this in turn can scarcely mean that the event in question, although it occurs at the time at which it occurs without at that time having a successor, also occurs at some time later than that of its occurrence, and at that later time does have a successor; for, of course, no event ever does occur at any time later than that of its occurrence. The most, then, that can be meant by this definition of "past" is that a past event is one a successor to which occurs at some later time. Now of course it is impossible to deny that there are, in this sense of the term, past events. But it still remains true that they are all also, in the sense of the term now under consideration, "present" as well. By means of these definitions we shall be unable in many cases to distinguish a past from a present event, inasmuch as they oblige us to admit that every event which is past is also present. And thus Mr. Broad seems to be involved in one of his own difficulties, for there are many events which have both of these characteristics, "and yet they are inconsistent with each other" (p. 62). Nor can it legitimately be replied that an event is present at one time and past at another, for the definitions which we have given of past and present exclude anything of the sort. Nothing that can happen subsequently can change the fact that a given event at the moment at which it occurs has been succeeded by nothing as yet. It would consequently appear that, on the present interpretation, all events must be present events—and, as I have said, Mr. Broad does not seem to believe this.

The matter is not, however, entirely clear. For Mr. Broad does hold certain peculiar views about the past, which, if taken quite seriously, would seem to indicate that he does believe something very like this. Mr. Broad holds not merely that "the past is as real as the present" (p. 66); but also that "There is no such thing as *ceasing* to exist; what has become

exists henceforth forever. When we say that something has ceased to *exist* we only mean that it ceases to be *present*" (p. 69). And he also tells us that the sum total of existence at a later moment includes the sum total of existence at any earlier moment (*cf.* p. 67). Now I find no difficulty in supposing (and in fact it seems to me to be the case) that the events of the past are real, or even that they "exist," but I do find great difficulty in supposing, as Mr. Broad does, that they *still* exist *at present*, or that they *continue* to exist at any time later than that of their occurrence. For the very nature of an event is to be an occurrence, a happening, or, as Mr. Broad himself puts it, a "becoming," and it therefore is impossible for me to understand how an event can actually exist at a time when it is *not* happening. It consequently appears to me, when Mr. Broad holds that the sum total of existence at a given moment includes all the events which existed at previous moments, that he is also holding that all the events of the earlier moments are still actually occurring at the later moment. I understand, however, that this is not what he intends.

We may now pass to the consideration of some further interpretations of Mr. Broad's definition. (3) Perhaps someone might suggest that Mr. Broad does not mean by a "present" event one which *had been* succeeded by nothing at the time at which it occurred, but rather one which *has as yet* been succeeded by nothing. Unfortunately, however, it is rather too obvious that the expression "has as yet been succeeded by nothing" means simply "*has up to the present* been succeeded by nothing"; and this expression would therefore not constitute a useful definition of what it *means* for an event to be present. Or perhaps someone might suggest (4) that when Mr. Broad says that a "present" event is defined as one that is "succeeded by nothing," he really means "succeeded by nothing at the moment when it is asserted to be succeeded by nothing". But this too, quite obviously, will never do. For the very expression the meaning of which we are supposed to be explaining (*i.e.*, the expression "succeeded by nothing") here occurs in the expression which is offered as its explanation.

There is, however, one further possibility. Perhaps (5) Mr. Broad did not intend (although I can scarcely believe that he did not) to define "present" or "past" at all, but meant rather simply to define an event "present at a given time" as one which is "succeeded by nothing occurring at the given time" and similarly to define an event "past at a given time" as one "succeeded by something occurring at the given time".

If these were really the definitions which Mr. Broad intended to give, they would not be without their significance. They would, of course, readily serve to distinguish an event "present at" a given time from any event which is "past at" that given time; and I for one should have not the slightest objection to such a pair of definitions. In this sense every event would be "present at" the time at which it occurs, and "past at" every later time—and that is exactly what would usually be assumed to be the case. In fact these definitions are, expressed in a slightly different form, simply those which we have already given above. An event is "present at" a given time if it is not "succeeded by" (*i.e.*, earlier than) anything occurring at the given time—in other words, to say that an event is present at a given time is to say that it occurs at just that time. An event is "past at" a given time if it is "succeeded by" (*i.e.*, earlier than) anything occurring at the given time. Now, as we have already seen, these definitions, whatever their merits or defects, do not depend upon and make no reference to the doctrine of the "nonentity of the future," so that if Mr. Broad developed this doctrine in order that he might be able to formulate *these* definitions, he had only his labour for his pains. And in any case, as it seems to me, these definitions, although they embody a correct usage, carry us only a very little way in any attempt to construct a theory of time. In the first place, they do not in the least help us to explain how it can be that one event which is earlier than another, and therefore in this sense already "past" at the time when the second event is present, may nevertheless be in some sense "present" together with this second event in the experience of some subject (*i.e.*, in the same "specious present"). And in the second place, they do not serve to explain how it can be that an event which is in this sense "present at" a given time may nevertheless in some sense *not* be "present at" *the present time*. For an event to be present at a given time is *one* thing, and for an event to be present *now* is quite another. *All* events are present at some given time or other, but nevertheless there is some sense in which *not* all events are present *at present*. And to this meaning of the term Mr. Broad's definition gives us no clue at all. In other words, if we knew no more about past and present than Mr. Broad would, on this interpretation, be telling us, we should be able to tell what is meant by saying that an event is past or present *at a given time*, but we should not be able to explain in the least what is meant by saying that *some* given times are "past" and others "present".

We have now examined five possible interpretations of what Mr. Broad may have meant by defining a "present" event in the way which he does, and at the end it is not very clear what he did intend. At this point I find myself unable to offer any further very plausible interpretation, and can consequently only hope that I have not overlooked some simple and obvious alternative. If I have not, it has now been shown that Mr. Broad's conceptions of past, present, and future are either wholly untenable, or in so far as they are tenable are wholly independent of his theory of the nonentity of the future, and are moreover seriously incomplete.

III.

And hereupon we come to our third main point—the defence of a theory of the sort proposed by Mr. Russell. In a theory of this sort it is held to be possible (at least when the terms are understood in a certain sense) "to resolve the difference between past, present, and future into differences in the cognitive relations of our minds to different events . . ." (p. 60). Mr. Broad rejects views of this type because they appear to him to presuppose that the series of events in time has no intrinsic sense, but that "it gains a sense, and we become able to talk of one event as earlier than another, and not merely of one event as between two others, because the attribute of presentness *moves* along the series in a fixed direction" (p. 60). We have ourselves taken the view that the series of events in time does have an intrinsic sense, and that this intrinsic sense is, as Mr. Broad holds, "essentially bound up with the distinction between past, present and future" (p. 58) *in one sense of these terms*. But without denying any of this we have already seen reason to believe that any adequate treatment of the nature of time must give an account of at least two other very important senses in which these terms are used. And we have now to insist that in these other two uses of the terms the distinction between past, present, and future *is* derived from differences in the relations which the series of events in time sustains to our experiences. Mr. Broad thinks that this is impossible, for the reason that our experiences themselves also have the characteristics of pastness, presence, and futurity. I cannot see that we really get into the difficulties which he here alleges. To make this point clear it is necessary to introduce some of Mr. Russell's terminology. He defines "one momentary total experience" as the experience of a group of objects such that any two of them are experienced together

and anything experienced together with all of them is a member of the group. To say of two objects that they are "experienced together" does not, for Mr. Russell, necessarily imply that the two objects are simultaneous, although they *may* be so. For objects which *succeed* one another may also be "experienced together"; and in fact it is in terms of this unique relation of "being experienced together" which we find holding between some of the objects of our experience, even when these objects succeed one another, that the peculiarity of the "specious present" would, on this view, be defined.

Employing this terminology we can hereupon proceed to define the first of the two further uses of the term "present" to which we have referred—the use, namely, in which the "present" is relative to the "specious present". The definition is as follows: an event is "present" relative to a given momentary total experience if it is simultaneous with any of the objects of that one momentary total experience; and an event is "past" relative to a given momentary total experience if it is "earlier than" all of the entities that are "present" relative to that experience. Mr. Broad would here raise the difficulty that this does not really suffice to distinguish a past from a present event, inasmuch as every event (neglecting for the moment the question of the future) has *both* these characteristics relative to the experience in question. This, however, is not really the case. What is true is that any given event which is present relative to one momentary total experience is past relative to *another* and *later* momentary total experience. Mr. Broad would here doubtless interpose another objection. He has already admitted (p. 61) that it may be possible to reduce past and present 'in *external Nature*' to "certain relations between objective events and minds which observe them"; but he adds the warning, "But it does not follow that these characteristics can be analysed away in this manner out of *Reality as a whole*, which of course includes observing minds as well as what they observe". But now, so far as I can see, our definitions of past and present apply just as well to the "observing minds" and their experiences as to "objective events". If we accept Mr. Broad's own account of the "specious present" (pp. 348 sqq.), an act of experiencing is contemporary with part of what is being experienced. An act of experiencing will then, in accordance with our definition, be present always relative to itself, inasmuch as it will always be simultaneous with some of its objects, and it will also be "past" relative to any later act of experiencing.

And every act of experiencing will in any case also be present, in our *former* sense of the term, at the time when it occurs, and past at any later time.

It might, of course, hereupon be objected that "acts of experiencing" are themselves events which change in the course of time in respect of these characteristics of presentness and pastness. We have explained how it is that an act of experiencing may be "present relative to itself" and yet "past relative to" a later act of experiencing; but, it might now be said, does not an act of experiencing which is perhaps thus always "present relative to itself" change nevertheless *relative to the subject of the experience* from present to past? What *was* his act of experiencing is *no longer so*. We seem to have no way, on our present view, of distinguishing an act that is present relative to a given subject from one that is past relative to that same subject, inasmuch as each one of his acts has *both* of these relations to the subject in question—and we cannot save ourselves by adding "but at different times," for that would be simply to give away our whole case. To this we may, however, reply that "present relative to a given subject" has no meaning other than "present relative to a given momentary total experience of a given subject," and that if a given event is present relative to a given momentary experience of a given subject it always remains so—the utmost that can also be true being that it may also be past relative to a later momentary experience of that same subject. The "subject" no doubt, in a sense, "endures" or "continues" throughout its changing momentary experiences. This, however, does not mean that the subject is an entity which itself literally passes along the series of its various acts, making each of them in turn now "present" relative to itself in a new and unique sense of the term, and now "past".

The "subject" in question would, I take it, be something of the nature of the "soul" as described by Mr. Laird (*Problems of the Self*, pp. 359-360), or of the (as I suppose) essentially similar "psychical continuant" of Mr. Johnson (*Logic*, Part III., Chapter VII.). That is to say, it would be a whole or unity of which its various acts are components—as Mr. Johnson puts it, "a causal unity of connexion between its temporally . . . separated manifestations" (p. 99). And Mr. Johnson himself draws the consequence (pp. 99-100): "It is natural to ascribe change to the modes of manifestation, and permanence to the substance to which these manifestations are referred; but this is an inadequate expression of the antithesis; for, to express the matter accurately, the only things which can be said temporally to

exist are the manifestations themselves". The self is not involved in temporal "passage". It does not itself move along the series of its acts. It is instead simply the unity of these acts. The only succession is in the acts themselves. But this succession has already, in our view, an intrinsic "sense"—one act is earlier or later than another in just the same sense in which the events within any specious present are so.

It still remains for us to give an account of the second of the two uses of the term "present" referred to above. We hold, as we have now made plain, that no event ever changes from past to present relative to any given momentary total experience. But we have not yet explained how it is that we are able to distinguish among events all of which are, relative to different momentary total experiences "present," some which are, as we say, *now* present, or present *at present*, from others which, although in one sense "present," are at any rate present *no longer*, but are instead *past*. We are here obviously employing the terms present and past in a way different from any that we have hitherto explained. We have already defined "present relative to a given momentary total experience," but here is a use of the term "present" which seems to be *absolute*. The explanation appears, however, to be as follows. The meaning of the term "present" as we have just been explaining it is indeed in a sense "relative," *i.e.*, it is not in this sense to be used in isolation, but only as a constituent of the fuller expression "present relative to *X*" (where *X* is some particular momentary experience); but it is nevertheless *constant*, *i.e.*, any such expression as "present relative to *X*," is understood, once the *X* in question has been definitely settled upon and so long as this value of *X* remains constant, as having one and the same significance on every separate occasion of its employment. On the contrary, in the use of the term "present" which we are about to explain, its meaning is, on every separate occasion of its employment, in a sense "absolute," *i.e.*, it is not employed merely as a constituent of an expression of the form "present relative to *X*"; but it is *not constant*, *i.e.*, it is understood to possess a different significance *on every separate occasion of its employment*. According to this usage when anyone at the time of having a given experience asserts that a given event is "present" he means that the event in question is "present relative to" the given experience. (It will of course here be recalled that the meaning of "present relative to a given experience" has already been independently defined). But if anyone at the time of having another experience then asserts that a given

event is "present" he means that the event in question is "present relative to" *that* experience. Another way of putting the same point would be to say that in this usage the term "present" means "simultaneous with something experienced together with *this*," where "this" is understood to be the proper name which the subject of a given experience employs at the time of that experience to name some object of that experience. The term "present," in this use of the term, although it has a determinate meaning on every occasion of its employment, will be seen to possess no meaning which is carried over from any one occasion of its employment to any other. It is consequently not possible to give any one general definition of its meaning, inasmuch as it has a different meaning every time it is used. It is possible, however, to explain *how* its meaning varies, and in what respect its meaning on one occasion of its employment is like or different from its meaning on other occasions, and this we here profess to have done.

I now proceed, therefore, to offer an interpretation of the expressions which have hitherto occasioned us some difficulty. Whenever anyone at the time of having a given experience makes the statement "*X* was once present" (where *X* represents some determinate event) he is asserting with regard to *X* the characteristic "present relative to" some earlier momentary experience—earlier than that is than the given experience. Similarly, if anyone makes the statement "*X* is not now present," he is asserting with regard to *X* the characteristic "not simultaneous with" any event which is an object of the given experience. And again, if anyone makes the statement "*X* is now past," he is asserting with regard to *X* the characteristic "present relative to" some earlier experience, and also the characteristic "not simultaneous with" any event which is an object of the given experience. The interpretation would, of course, be the same for all assertions of similar character, and would also hold without alteration where the *X* in question is some act of experiencing of the subject in question. And thus there apparently need be no difficulty, on our view, of explaining any assertion of the kind.

Mr. Broad says (pp. 61-62): "The difficulty about past, present, and future in general can be summed up in two closely connected paradoxes. (i) Every event has all these characteristics, and yet they are inconsistent with one another. And (ii) *events* change in course of time with respect to these characteristics. . . . The connexion between the two paradoxes is, of course, that we get into the second directly we take the obvious step to avoid the first." Now it seems to me that

we can avoid the first of these paradoxes *without* falling into the second. We avoid the first by pointing out that if a given event is present relative to one momentary total experience, it is never past relative to that same experience. The experiencing itself is, of course, also an event; but the same assertion applies also to it: if it is present relative to a given momentary total experience (*i.e.*, itself) it is never past relative to that same experience. *The experiencings of a subject, moreover, are, strictly speaking, neither present nor past relative to that subject—they are manifestations of it, or components of its unity.* They are, however, earlier or later relative to one another. This does not mean, of course, that such expressions as "this is my present experience," or "that experience is happily past," have no legitimate significance. In these expressions the terms "present" and "past" are employed in the "absolute" way which we have just explained.

As to the second of Mr. Broad's difficulties, we avoid it simply by never falling into it—*i.e.*, we do not assert that any event which is present relative to a given momentary experience is ever past relative to that same experience. In other words, we deny that events ever undergo any change with respect to their temporal characteristics. We can, however, say significantly that a certain event which was present has now become past. But here again we are employing these terms in the "absolute" sense.

When all is said and done, I fancy that Mr. Broad would feel that this account of the matter leaves out something that is very fundamental to the nature of time. His is, as it appears to me, at bottom very much the same sort of view as that of M. Bergson. His concept of an unanalysable "becoming" is very similar to M. Bergson's equally ultimate "duration" and to Mr. Whitehead's "passage of nature," or "moving on" (*Concept of Nature*, p. 54). As Mr. Broad says (p. 59), "We are naturally tempted to regard the history of the world as existing eternally in a certain order of events". The trouble with this is that it seems to take the temporal character of succession out of time and to make it "static," or, as M. Bergson puts it, to "spatialise" time. Nothing any longer seems to *happen* or to *become*; events no longer *pass*, but each instead remains eternally fixed. Now there seems to me to be a strange mixture of truth and illusion in all this. There is certainly an unique character about time which cannot be reduced to anything else. Time is filled with "*events*, and events are *happenings*," things that "come to pass," that succeed one another in a fixed direction of earlier and later. This feature of time is revealed to us in our im-

mediate experience of duration, or the passage of events. But we may be equally certain that, however much of succession there may be in events, every event has in the order of succession just the place that it has and none other. The order as a whole, however much it may be an order of change and of succession, must in a sense be "static," *for it must be true that it is what it is*. Let fluidity be never so fluid, the fact that it is so remains unaltered. These are simply the necessities of logic.

III.—NICHOLAS OF CUSA.

BY T. WHITTAKER.

FROM the birth of Nicholas of Cusa in the first year of the fifteenth century to the death of Giordano Bruno in the last year of the sixteenth, there extends the whole of the period commonly known as the Renaissance. Before Cusanus we are back in the later Middle Age; after Bruno we are in the distinctively modern world. And, unlike as were the fates of the Roman Cardinal and the condemned heretic, the two men were much alike not only in ideas but in spirit. The hopefulness of the early Renaissance, so conspicuous in Cusanus, was retained by Bruno in the time of the Catholic reaction. And there are more than mere germs of Bruno's pantheism in the work of the "divine Cusanus" whom he so enthusiastically celebrated.

The resemblances need not surprise us too much; for there is a continuous pantheistic tradition running from ancient to modern philosophy. Between Cusanus and Bruno there is undoubtedly direct affiliation of doctrine; but the general derivation is largely independent of contacts between one pantheistic thinker and another. There was a common source by which orthodox scholasticism had been permeated in such a way that a thinker predisposed to pantheistic ideas could draw them from the dialectical discussions in the ordinary text-books of philosophy. And the later thinkers often knew nothing of the earlier ones whom they most resembled. Neither Cusanus nor Bruno nor Spinoza can have read Erigena, whose great work *De Divisione Naturæ* was sentenced to destruction by Pope Honorius III. in 1225, and did not come to light again through a single copy till 1681. And there is no evidence that Spinoza had read either Cusanus or Bruno. Directly or indirectly the source is always Neo-Platonism. Cusanus, one of the first in Western Europe to study Greek after its revival, knew the ancient Neo-Platonic thought to some extent directly; but he probably did not know very much more of it than Erigena, one of the last who could read Greek before it ceased to be studied for

six centuries. The knowledge he chiefly shows is of the positions transmitted by "Dionysius the Areopagite" and by commentators like Chalcidius, the translator of Plato's *Timæus*. To Bruno the sources were far more abundantly accessible; and he had a knowledge of Greek, though he probably read the Greek authors chiefly in Latin translations. Spinoza's source for the Neo-Platonic modes of thinking discoverable in the minute structure of his philosophy is to be sought in scholastic text-books, Jewish and Christian, and in some heterodox Jewish philosophers. His distinctive positions cannot be explained, as was for a long time supposed, simply from Descartes.

For the logical character of the pantheism that took form in the newer minds, it does not seem to have mattered very much whether they derived the elements of Neo-Platonic thought from the original pagan or from Christianised sources. Within the limits of pure philosophy Cusanus, who knew chiefly the more or less Christianised Neo-Platonism of "Dionysius," scarcely yields in rigour and audacity to any one. In the opening chapters of his most celebrated work, *De Docta Ignorantia*, he is recognisable at once as a great and an original thinker. It is on the basis of the first two books of this work that I propose to write a brief exposition of his philosophical doctrines.

The opportunity has been furnished by a critical edition published in Italy in 1913.¹ This is the first new edition of the Latin text since 1565. The work itself, we know from an extant record, was finished on the 12th of February, 1440, eight years before Cusanus was made a Cardinal. His fame in his own and the succeeding age was first German and Italian, and then European;² and it was largely among reformers. No doubt his proof, before Valla, of the historical impossibility of the "Donation of Constantine," helped in this.³

The title of the work that will always preserve his memory, *De Docta Ignorantia*, must not mislead us. His "learned ignorance" is completely different from Pyrrhonic suspension of judgment. It is conceived and put forward as a kind of knowledge, and as knowledge of the highest things. It is such knowledge as is attainable of the Infinite, or Absolute,

¹ Nicolai Cusani *De Docta Ignorantia Libri Tres*. Testo Latino con Note di Paolo Rotta. Bari: Laterza, 1913.

² In the dedication prefixed to the fourth edition of his works (Basel, 1565), there are mentioned as interested in Cusanus "viri Germani, Galli, Itali, Hispani, Angli et Poloni" (Rotta's Preface, p. xxxv).

³ Rotta, p. xxxvii, n. 1.

and its relation to the universe. Want of this "learned ignorance," Cusanus says, prevented the ancients from innovating in astronomy as much as they might have done.

A century before Copernicus, he had completely rejected the Aristotelian and Ptolemaic astronomy. The earth, he distinctly says, moves; and so does every other body in the universe. The other worlds, he also held before Bruno, are inhabited. He did not, however, in any way, so far as I can make out, anticipate the definite Copernican hypothesis regarding the solar system, on the multiplication of which Bruno built his general theory of the constitution of the universe. Both he and Bruno deduce from their metaphysical principle, which asserts the infinity of the Cause or Reality, the position that the universe is in some sense infinite; but the senses differ. In sweep of poetic vision, Bruno has an immense advantage. His absolutely infinite universe, imagined to any assignable extent, remains always picturable. Cusanus seems to have felt no need for anything but the most generalised intellectual statement, and gives no new picture of the order of the worlds. Yet he is not without a compensating advantage. He had thought with more accuracy about the presuppositions of mathematical science; and it is possible that, while the abstract formula of Cusanus still remains defensible, Bruno, in making a leap from his own metaphysic to a spatially infinite universe with absolutely innumerable worlds, like that of Anaximander or of Lucretius, had come upon a view apparently imaginable without limit but in the end unthinkable.

Cusanus, on the other hand, definitely refuses to infer, from the mathematical possibility of adding space to space and number to number for ever, the actual existence of infinite space or of an infinite number of things. His universe, though he sometimes calls it infinite, is therefore simply a universe without assignable limits; and he comes remarkably near, though he does not actually arrive at, the description of the whole, by modern physical relativists, as "finite but unbounded".

More detail on these questions will come later. The preliminary outline should have made it clear that the metaphysic of the Infinite or Absolute was not conceived by the thinkers whom it inspired as a barren formula compatible with any view of the visible world. For them, it gave coherence and direction to the revolution that new science was preparing; and the very difference, along with likeness, in the applications made by Cusanus and by Bruno, is evidence of its stimulating power.

Linking himself to ancient thinkers, Cusanus, in his dedication to Cardinal Giuliano Cesarini, lays stress on "wonder" as the beginning of philosophy. There is a natural desire, he says, in all things to exist in a better mode. Thus a sane and free intellect desires and thinks it embraces truth. Difficulty increases in the process of search, especially in mathematics. All knowledge is by a kind of analogy or "proportion"; and the infinite as infinite, since it escapes all proportion, is unknown. Proportion cannot exist without "number". This conception Pythagoras extended from mathematics to all knowledge. Trying to go beyond number to the infinite, Socrates, Solomon, and "a certain other man of divine spirit" (conjectured by the editor to be Hermes Trismegistus)¹ have found that this ultimate knowledge is concealed from sight. Yet the knowledge that we do not know is itself an attainment in which the intellect can find satisfaction; and this it is that we call "learned ignorance".

As with all who speak of the unknowable, we soon find that much concerning it is held to be known. Cusanus applies to it first his favourite term, "the maximum". The maximum is that than which there can be nothing greater. It is absolutely one because it is all, and all things are in it because it is the greatest. Because nothing is opposite to it, the minimum coincides with it; wherefore also it is in all. In Book i., the philosopher says in laying down his plan, it will be treated as incomprehensible by human reason (*i.e.*, as God); in Book ii., as universal unity of essence in the many things of the world, not having subsistence outside the plurality in which it is. Book iii. will be devoted to the mysteries of Christian theology, showing how the determinate and particular in Jesus is at the same time the universal and absolute.

It is in reference to this third head that Bruno becomes, as Roman Catholic writers admit, though the admission is not meant for praise, "more logical than Cusanus". With extreme candour he told the Inquisitors at Venice that he was unable to combine, consistently with his speculative philosophy, the finite and the infinite in the Incarnation. In truth, Book iii. is quite arbitrarily connected with the rest; and I do not propose to give any exposition of it. It is not, like the speculative theology of Origen or of John Scotus Erigena, an attempt to transform Christianity itself, but simply sets forth the dogmas of Christian orthodoxy with a slight colouring from the philosophical vocabulary

¹ Lib. i., cap. 1, p. 4 n.

elaborated in the first two books. Bruno does not ignore this side of the divine Cusanus, but remarks on it as something that infected his genius, which without it "would have been not merely equal to but far superior to that of Pythagoras."¹

At the end of the chapter in which he sketches his plan, Cusanus puts excellently a point on which Plato and Berkeley also have incidentally dwelt; namely, that in philosophical discussion it is necessary to look beyond the words to the meanings, not quibbling over the exact literal or grammatical interpretation.²

Already in this chapter we find the position, common to Cusanus and Bruno, that in the Absolute all that is possible exists actually. Two or more things, he proceeds in the next, cannot be found of such similarity and equality that there shall not be other possible ones more similar up to infinity. Hence, measure and measured, however near equality, will always remain different. The finite intellect, therefore, cannot precisely understand the truth of things by similitude. For there is nothing precisely like the indivisible truth to measure that in which it consists; just as that which is not a circle cannot measure the circle, of which the being consists in something indivisible. But as a polygon inscribed in a circle becomes more and more similar to it as it has more angles, though it never becomes equal even by multiplication of angles to infinity, unless it is resolved into identity with the circle; so we approach the truth more in so far as we learn that in its most absolute necessity of identity with itself it is incomprehensible by us.

This leads to questions concerning the theory of knowledge, to which Cusanus in his various works was always returning. His general position is that we attain the maximum "not otherwise than in an incomprehensible manner". The whole development of his thought here is from Platonism. Like Plato and, after him, Proclus, he is seeking to formulate a mental act that is not step by step reasoning; a kind of "nameless" process.³ He himself, in another work, refers to Plato's well-known phrase in the *Timæus*, where empty space or "not-being" is said to be apprehended by a sort of bastard reasoning (*λογισμῷ τιμι νόθῳ*). The indeterminate possibility called matter Cusanus describes as got hold of "per adulterinam quandam rationem".⁴ This is to apply the

¹ See Dr. J. L. McIntyre's *Giordano Bruno*, Part ii., ch. 1, p. 141.

² Lib. ii., cap. 2, p. 6: "Oportet autem attingere sensum volentem potius supra verborum vim intellectum efferre quam proprietatibus vocabulorum insistere."

³ Lib. i., cap. 5 *init.* The maximum is "innominabiliter nominabile".

⁴ Cited by Rotta in a note to lib. ii., cap. 8, p. 91.

phrase of Plato to the Aristotelian matter with which his own "matter," as it came to be called, was identified by the Neo-Platonists, though Aristotle himself knew that "the Platonic matter" was simply space.¹ The point, however, does not very closely concern Cusanus, who did not admit bare possibility in general, but, as we shall see, only particular possibilities. His own view about the mode of reaching the maximum resembles rather that of Proclus, who says that the One, at the other extreme from matter or bare possibility, is apprehended by "spurious intellect" or "bastard intuition" (*νόθος νόος*).² We must admire the candid concession all round of a defect in point of form. At the same time we must remember that the mind does not discover, but only tests truth, even in the regular sciences, by syllogism and the canons of induction. And the anomalous processes may be resolved; as for example Berkeley, in his *Theory of Vision*, resolved the appearance of direct intuition of space into a series of unformulated but effectual judgments. Perhaps something similar may be done for the paradoxes about the Infinite and Absolute which follow.

For we have now arrived at the famous principle of the coincidence of the maximum (than which there cannot be a greater) with the minimum (than which there cannot be a less). Cusanus tries to make this clearer by telling us to take the "most" great and the "most" small in quantity and eliminate intellectually the "great and small": then we shall find coincidence in the superlative. This superlative is beyond all opposition, above all affirmation and likewise negation. "And all that is conceived to be, no more is than it is not. And all that is conceived not to be, no more is not than it is." "God, who is least of all light, is most of all light."³ This transcends our intellect, which cannot combine contradictories in their principle by the way of reason. We have to see in a way beyond all discourse of reason that to be absolutely greatest is to coincide with the absolutely least.

The reflection to be made on all these quasi-mathematical paradoxes is that they have their real basis in a psychological thought. The insight out of which they sprang is that mind

¹ *Phys.* iv. 2, 209, b 11. Zeller quite rightly quotes this in support of his own view: see *Die Philosophie der Griechen*, ii., 1, 4th ed., p. 735, n. 3.

² I have tried both renderings; the first in *The Neo-Platonists* (Supplement), the second in the article "Reason" in the *Encyclopædia of Religion and Ethics*.

³ *Lib. i.*, cap. 4: "Deus est maxime lux, qui est minime lux." This is probably a reminiscence of Psalm cxxxviii. 12 (Vulgate), quoted more exactly by Erigena and by Bruno: *Sicut tenebrae ejus, ita et lumen ejus*.

at once contains infinite space as perceived or conceived and itself does not occupy the minutest portion of space. When this insight tries to give itself a geometrical or arithmetical form, it inevitably falls into paradoxes. Thus Hamilton set against one another the Infinite and the Absolute, the "unconditionally unlimited" and the "unconditionally limited," and made them out irreconcilable by treating them as spatial. If we take the Absolute and Infinite as metaphysical terms, as referring to something of the nature of mind, the contradiction disappears and the coincidence is obvious. Immaterial reality, as distinguished from appearance, is at once absolute and infinite, that is, complete in itself because it contains all, and boundless because there is nothing to limit it. If, however, we must externalise it in order to have some imaginative form before us, then, it seems to me, the result that follows from the arguments of Hamilton and Mansel is not the agnosticism derived from them by Spencer, but acceptance of the coincidence of opposites as stated by Cusanus and Bruno. It may be observed that the Eleatics, before the great psychological development of philosophy, had, on their own line of objective thinking, obscurely arrived at something like this. Parmenides showed that "that which is" must be self-complete or absolute, and Melissus showed that it must also be infinite or boundless. Between came the paradoxes of Zeno on space and motion.¹

Without number, Cusanus proceeds, there could be no order in things, no determinate relations of the many. In number we arrive at unity as the minimum. Unity is not a number, but the principle of all number, and this coincides with the maximum, which is infinity. This unity which is infinity, Cusanus expressly says, is God.² God is one in such manner that he is in act all that it is possible to be. As unity is presupposed by number, so the pluralities of things descend from infinite unity, and could not be without it.

The maximum is above all nameable being. It is most true that, simply in itself, the maximum "is or is not," or "is and is not," or "neither is nor is not."³

Cusanus recurs frequently to ideas of a philosophical Trinity. The first of his developments may be stated in detail as an example of the procedure.

Unity is prior by nature to otherness (alterity) which is the same as mutability; and that which naturally precedes mutability is immutable, and therefore eternal. Unity therefore is eternal. Equality similarly is prior to inequality,

See "A Note on the Eleatics," *MIND*, October, 1924 (N.S., xxxiii., 428).

² *Ibid.* i., cap. 5.

³ *Ibid.*, cap. 6.

while inequality and otherness are together by nature. Equality therefore is eternal. Unity is either connexion or the cause of connexion; duality either division or the cause of division. But division and otherness are together by nature; wherefore also connexion, like unity, is eternal, since it is prior to otherness. But there cannot be more than one eternal; whence it follows that unity, equality and connexion, since they are all eternal, are one. "*Et haec est illa trina unitas, quam Pythagoras, omnium philosophorum primus, Italiae et Graeciae decus, docuit adorandam.*"¹

A warning given at the end of these speculations is that, to arrive at reality, at the true maximum, we must go beyond all mathematical figures.² After that, we plunge into mathematical symbolism. The use of it is defended on the ground that mathematical abstractions come nearer than any other images that we can use to representing stable reality; and images are indispensable. For Cusanus, Pythagoras, with his doctrine of numbers, is the first of philosophers; next come Plato and the Platonists, among whom he counts Augustine. Even Aristotle, he says, "who wished to appear singular by confuting those before him,"³ has to recur to mathematical forms for his scientific explanation of forms in nature. This is of course in the characteristic tone of the revolt from Scholasticism.

Cusanus, however, does not relax the scholastic effort after exact thinking. "Everything mathematical," he declares, "is finite, and cannot even be imagined otherwise."⁴ Yet mathematical science leads beyond the finite. Every figure, without deviation from the rules of its construction, can be made by continuous modifications to come nearer and nearer to coincidence with figures of which the rules of construction are different. For example, the larger you make the circumference of a circle, the nearer an arc of it is to a straight line; the arc, therefore, of a circle than which there can be no greater will be actually a straight line. If supposed infinite, then, the curve and the straight line coincide. Considered as having reached the end of their modifications, he proceeds to show in detail the line, the triangle, the circle and the sphere, are all at the same time infinite and one. That in which the notions of all the figures end is not, however, mathematically imaginable, but is simply "infinity". Thus, in dealing with mathematical "signs" in a "transcendent" manner, we find ourselves on the way to the highest reality, which is not in itself a possible object of mathematical science.

¹ Lib. i., cap. 7.

³ *Ibid.*, cap. 11, p. 25.

² *Ibid.*, cap. 10.

⁴ *Ibid.*, cap. 12, p. 26.

One method of getting at results is to set lines or surfaces in imaginary motion. Take a radius of a circle and set it in motion with the centre as fixed point; you will get as the result a three-sided figure. If you carry it back to its first position, you will get the complete circle. Continue the radius from the centre to the opposite point in the circumference; you will have marked off a semicircle. Set the semicircle in revolution round the diameter, and you will have a sphere. Now an infinite line is in act all that a finite line is in potency; and so it is at once triangle, circle and sphere. All these, as coinciding with the infinite line, are infinite. But this only means that *if* there were an infinite line it would be all these.

The position, Cusanus allows, is finally impossible as applied to quantities; but, ascending by it to things that are not quantitative, you see that what in quantities is impossible is in the whole necessary. Quantity, we may put it, is an abstraction which, when you try to complete it, leads beyond itself by revealing its incompleteness. This may sound rather Hegelian; but Cusanus is one of the thinkers in whom we are permitted to find anticipations of Hegel.

In the maximum considered as metaphysical reality, all that is possible is also actual. "Absolute possibility itself is not other in the maximum than the maximum itself in act, as an infinite line is in act a sphere; it is otherwise in the non-maximum, for there potency is not act, as a finite line is not a triangle."¹ We see that for Cusanus, as for Bruno later, in spite of the vigorous effort to get clear of the authority of Aristotle, his antithesis of the possible and the actual (*δυνάμει* and *ἐνεργείᾳ*) remains a "form of thought". The real inspiration of the thinking, it is true, does not come from Aristotle but from "Dionysius," the bearer of the systematised Neo-Platonism of Athens into Christian theology. God, who is the maximum, Cusanus proceeds, is not this to the exclusion of that; for, as he is all things, so also he is nothing of all things. He is known above all mind and intelligence; and this is the "learned ignorance". Returning to his previous formulations, Cusanus declares the minimum not opposed to the maximum; "but all that is measurable falls between the maximum and the minimum".²

In this region of the measurable, nothing is equal to anything else: "no two finite lines can be precisely equal";³ but all participate, though unequally, in the maximum. The infinite line is the *ratio* of all finite lines; a position expressly derived from the Platonic commentators, and meaning, if we

¹ Lib. i., cap. 16, p. 32.

² *Ibid.*, p. 35.

³ *Ibid.*, cap. 17, p. 38.

may go back to Plotinus for its origin, that the law or formula of the production of a line is independent of any particular dimensions. Of the maximum beyond intellect, this infinity which is in each finite thing and yet in none so far as it is a particular thing, must be for us a symbol. The quest of the ultimate maximum issues in mystery. The way to seek knowledge of it is to remove in thought all participation of particular beings. When all these are removed from the intellect, nothing appears to remain. "And therefore the great Dionysius says that understanding of God rather approaches to nothing than to something."

What is meant by greater and less participation is illustrated by straight and curved lines. The straight line participates more in the "infinite line," which is the line as line; for the curve as such can be neither a maximum nor a minimum. "The most and the least curved is not other than a straight line."¹ Thus the circumference of a circle participates more in rectitude in proportion as it is larger. The problem therefore in dealing with curves is to resolve the curvature in relation to rectitude.

The resolution of the triangle into a line by modification of its sides and angles to infinity is applied as symbolism to the reconciliation of trinity and unity. Out of this reconciliation there emerges the truth that the opposition of plurality in general and of unity, of "distinction and indistinction," ceases to have a meaning in the infinite.² Counting is inapplicable to deity; a thought with which Cusanus is so possessed that he attributes it to Augustine; quoting him as saying, *Dum incipis numerare trinitatem, exis veritatem*.³ Trinity and unity are the same in the infinite and eternal because it embraces contradictories. The maximum, "though infinitely above all trinity,"⁴ is to be called triune, as in mathematics the triangle, being the polygon with the smallest number of sides, can be taken at once as the minimum and the adequate representation of polygonal figures in general; these serving for symbols of all the multitudinous operations of nature and of the mind, comprehended in the absolute maximum.

Applying next the notion of the circle—circumference and

¹ Lib. i., cap. 18, p. 40.

² *Ibid.*, cap. 19, p. 44: "Nam ubi distinctio est indistinctio, trinitas est unitas; et e converso ubi indistinctio est distinctio, unitas est trinitas".

³ I accept it on the authority of the editor (p. 43 n.) that Augustine has used no such expression as that with which he is here credited. Cusanus, though erudite, is loose in his quotations.

⁴ Lib. i., cap. 20, p. 47: "licet sit supra omnem trinitatem per infinitum".

centre, with diameter as medium—to the unity of the maximum and the minimum, Cusanus, passing over from symbolism, shows how the maximum is identical with nothing that exists nor yet different from anything. Its all-containing unity comprises being and not-being, “all things that are and are not”.¹ The unity of the motions in it from potency to act and from act to potency, the alternate composition of individuals out of principles and resolution of individuals into principles, “consists in a certain circular perpetuity”.

The providence of God includes all things, even contradictions. It comprehends in its unity both the things that happen and those that do not happen but can happen. “All things in God are God, who is absolute necessity.”² So far the doctrine is entirely pantheistic; but there is an approximation to ordinary theism when Cusanus adds that there are many things which God could have providentially determined but did not and will not, while he did providentially determine many things that he had the power to withhold. This is a concession that disappears from the more consistent pantheism of Bruno, who declares that in the infinite universe every possibility is realised. In God, will, power and act are the same.

For the comparison of “the existence of God in act” to an infinite sphere, Cusanus finds a precedent in Parmenides. His editor points out an inexactitude in the reference;³ yet that both Cusanus and Bruno found an affinity in their own thought to that of the Eleatics is a fact to be accounted for in the history of philosophy. Cusanus at any rate quite rightly takes the sphere to signify for Parmenides the all-inclusive perfection of all that is. Considered in relation to the sphere, all motion, he says, is rest; rest being the end of motion. When he remarks parenthetically that “the sphere arises after infinite circulations,” there may perhaps be a glance at the theory of cosmic evolution in Empedocles; but the revival of the Ionian side of Greek thought, which Empedocles tried to combine with the doctrine of his Eleatic master, was reserved for Bruno.

In the rest of Book i., Cusanus undeviatingly follows out the logic of his system. No affirmative name, he says, is applicable to God, not even that of creator, except in relation to creatures, for he is not any one thing more than he is all others. “If you call him truth, falsehood comes in the way;

¹ Lib. i., cap. 21, p. 49: “reperitur omnia quae sunt et non sunt ambire, ita quod non esse in ipso est maximum esse, sicut minimum est maximum”.

² *Ibid.*, cap. 22, p. 51.

³ *Ibid.*, cap. 23, p. 53n.

if you call him virtue, vice comes in the way; if you call him substance, accident comes in the way, and so with the rest."¹ Even the name of unity, though it seems nearest, is infinitely distant from the reality. The argument is confirmed by citations from Hermes Trismegistus and from Dionysius. In Augustine (less clearly) support is found for the view that the names of the Trinity and of its Persons, being affirmative names, are only relative to distinctions in the human mind. There is no exception even in the most sacred names among the Hebrews and Chaldeans, unless it be the ineffable tetragrammaton (JHVH);² but that is an exception because it affirms no property. In short, it is "the exception that proves the rule."³

The names assigned to God in the pagan religions are interpreted as names relative to the variety of natural powers in the world. With evident sympathy, Cusanus remarks on the bisexual character attributed to deity in the Hermetic books, and quotes a Roman poet "Valerius," who cannot be identified, for the ascription of double sex to Jupiter.⁴ The varied powers being so many, none can be excluded if we attempt to express what is ultimately inexpressible. Yet there is also a negation which excludes all. The idolatry into which the simple folk among the pagans fell was the result of attending to the manifestations of divinity as "explicit" in the world (explicationem divinitatis), instead of adoring the pure unity of God himself, like the Jews and some others. When they ought to have used the varied manifestations as images, they took them for truth. This view Bruno modified only by arguing that there was no error.⁵ The Greeks and Egyptians knew what they were doing. It was the Jews and their successors of Christendom and Islam who could not distinguish between the image and the natural or divine power signified by it.

In the last chapter of Book i., we arrive at the culmination of the doctrine in a formal statement of the "negative theology," for which there is an element of idolatry even in the worship of the Jews and Christians, though this vestige is admitted to be necessary. So long as religion affirms of God, as it must, the best we know of "creatures," addressing him

¹ Lib. i., cap. 24, p. 57.

² Cusanus knew Hebrew and gives the Hebrew letters.

³ See Professor Carveth Read on "*exceptio probat regulam*" (*Logic*, 4th ed., p. 274).

⁴ Lib. i., cap. 25, p. 60: "Iovem omnipotentem, genitorem, genetrixemque Deum."

⁵ Cusanus himself allows this as regards the philosophers, referring to Cicero *De natura Deorum*.

as one and three, most wise, light unapproachable, life, truth and so forth, there is, says Cusanus, still idolatry unless it calls in also the negative theology which removes all attributes. In so far as he is simply infinite, God is neither truth nor intellect nor light, neither Father nor Son nor Holy Spirit. Infinity, as infinity, is neither generating nor generated nor proceeding. "When considered as infinity, God is neither one nor many, and, according to the theology of negation, nothing is found in God but infinity." According to that theology, he is "cognoscible neither in this nor in a future world."¹ Nevertheless, the negations that remove the more imperfect things from the most perfect are truer than others. It is truer that God is not a stone than that he is not life or intelligence; truer that he is not ebriety than that he is not virtue; and, correspondingly, the affirmation is truer that he is intelligence and life than that he is earth, stone or body.

This of course is quite consistent with the rest. A pantheism so formally complete as that of Spinoza not only does not assert, but definitely denies, that all manifestations of the reality in things are equal. In Book ii., therefore, we go on to an account of the differences of manifestation within the universe. Nothing in it, Cusanus says, is precisely like anything else. Grades to which no limit is assignable can be passed through without reaching either the maximum or the minimum. The motions in the heavens are never exactly repeated. Even in geometrical diagrams actual equality is impossible; nothing agrees precisely with anything else in figure or in magnitude. Similarly for music, there are countless differences in instruments, voices, and so forth; it is only in the abstract rule that exact proportion obtains. Again, the arithmetical idea of number is not applicable with precision. No one is quite like any one else in anything; and if one were to try for a thousand years to imitate another, he would never attain precision, though the sensible differences might sometimes not be perceived. Changes of a thing can only take place by continuous degrees.

Positions like these passed over in one way or another to Bruno and afterwards to Leibniz; but there is not in Cusanus any anticipation of the central doctrine of Leibniz, the notion of a monad or ultimate individual, psychical in nature. In Bruno there is something of the kind; but, though Leibniz knew works of Bruno, the origins of his own doctrine seem to be traceable without supposing that his acquaintance with them had any important influence.

¹ Lib. i., cap. 26, p. 64: "nec cognoscibilis est in hoc saeculo, nec in futuro."

We have seen that, while the universe, in the view of Cusanus, has no assignable limits, it is not, as Bruno held, actually infinite in extension to correspond with the infinity that its principle has without reference to extension. As contrasted with the infinity of God, the universe could be greater than it is. The reason why it cannot actually be greater, is that matter, or possibility, in which it is founded, by its very nature cannot be extensible to infinity. Thus the mathematical paradoxes of Cusanus pass finally into symbolism. For Bruno also, they are not directly applicable to the cause or principle of the universe; they remain in the region of number and extension; but they have direct application to the universe regarded as actually infinite in space and with absolutely no limit—not merely no assignable limit—to the number of its "worlds".

Coming to the question of the individual, Cusanus treats it in a way that has little in common with Bruno's treatment of it by reference to atomic speculations. Nothing, he says, is from itself (*a se*) except the maximum simply as absolute. Since this is perfect, how then can there be imperfection in creatures? His reply, brought to its extremest generality, is that the unity in creatures comes from their cause, but that the plurality, the diversity, has no positive cause, but arrives contingently.¹ The creature is "neither God nor nothing"; but it is not a mixture, for there can be no mixture or composition of God (as being) and nothing. The detailed argument here is decidedly difficult; some of the positions stated being evidently only "dialectical". I agree with the editor² that the "pantheism" of some of them is only apparent, if he means naturalistic pantheism;³ but, in a more generalised meaning of the term, I do not see how the reasoned philosophy of Cusanus can be called anything else. What creatures have from God, Cusanus concludes, is the unity and perfection compatible with their contingency. Each created being acquiesces in its own perfection as a created being, not desiring to be any other thing supposed more perfect, but loving in the first place its own reality as a divine gift, choosing to perfect and preserve this incorruptibly.⁴

¹ Lib. ii., cap. 2, p. 71.

² *Ibid.*, p. 73 n.

³ This is definitely classed by Cusanus (lib. i., cap. 25, p. 61) as an error of some pagans, who held that God is not "outside things" except by an abstraction of the intellect, like "first matter". The element of "transcendence" that he insists on was, however, retained by Bruno, whose pantheism is undoubted.

⁴ Lib. ii., cap. 2 *fin.*

The philosopher himself is evidently not altogether satisfied with the position that individual differences are merely contingent; for in the next chapter he suggests a different answer to his question; *viz.*, that the many pre-existed from eternity in the mind of God, but under the form of unity. The divine intellect, knowing that things cannot participate equally in the equality of being, understood one thing in this way, another in that; and thus they are differently determined, though from one essence.¹ The former answer, however, is repeated on the next page: "the being of a thing is not anything in so far as it is a diverse thing".² The nearest Cusanus comes to a solution is to state the antithesis between the "complicatio" of the many in the unity of God and their "explicatio" in the plurality of things. He confesses that he does not in the end understand how this can come about; for of course "the mind of God," though he does not himself raise the objection, is a phrase not corresponding precisely to the "infinite" or "maximum" of his philosophy; but he finally points out, to those who speak in terms of popular theology: "If you say, his omnipotent will is the cause, and will and omnipotence are his being, you must necessarily confess that you are completely ignorant of the mode."³

Returning from the diversities of the universe to its nature as a whole, Cusanus finds that, in relation to its principle, the absolute maximum, it is only a relative maximum (*maximum contractum*). It imitates the absolute as far as it can, but is subject to the limitation that its identity is in diversity as its unity is in plurality.⁴ The entities in it were not successive emanations, but came forth all at once, since without all its parts in their kinds the universe could neither have been the universe nor perfect in its own manner. In its limitation (*contractio*) to being this or that in its different parts, and not simply one, consists its distinction from God. God, or the absolute maximum, unites contradictories, the world or universe only contraries.⁵ Through the mediation of the universe, God, who is the most simple unity, is in all things; as the plurality of things, by means of the one universe, is in God.

Cusanus cites from Anaxagoras the principle that all things are in all (*quodlibet esse in quolibet*), remarking that it is

¹ Lib. ii., cap. 3, p. 76.

² *Ibid.*, p. 77.

³ *Ibid.*, p. 78. As a possible aid to the imagination, a suggestion is added to think of one face mirrored at less and greater distances; the distances to be supposed not local, but signifying degrees of remoteness from the truth of the face.

⁴ *Ibid.*, cap. 4, p. 80.

⁵ *Ibid.*, p. 79.

perhaps older than Anaxagoras. He makes of it, however, not a physical but a metaphysical principle. He does not mean that no actual thing exists without a mixture, in greater or less proportion, of all the elements, so that no physical element is separable in its purity from the rest. What he seems to mean is that each particular thing points to all the other things in the universe as necessary to make up the whole in its organic unity. "One grade," as it is briefly expressed, "could not be without another, as in the members of the body everything contributes to everything, and all are contained in all."¹ As Humanity considered absolutely is to man as "contracta humanitas," so is God to the world.

The idea of "contractio" means essentially manifestation in things many and distinguishable and knowable only in relation to one another. The universe as "contractum" is not found except unfolded in genera (in generibus explicatum), and genera are not found except in species. Last, in this mode of consideration, come individuals as actually existent things. This Peripatetic touch at the end, Cusanus somewhat obscurely argues, is not inconsistent with his Platonism: "universalia" are not to be regarded as simply "entia rationis".²

Discussing the question whether there is an absolutely indeterminate possibility or matter, he concludes that there is not. Only in God do absolute actuality and absolute potency exist, and here they coincide. Absolute possibility in God is God. All things except the first principle being necessarily relative (contracta), nothing in them can be said to be in absolute, as distinguished from relative, potency.³ In things possibility is always determinate, so that the world could not have been except in the limited modes in which it is. There cannot be a maximum or minimum of possibility in things admitting of less and more, but only a relative possibility of particular things which depends on contingencies.

The predominant position of Platonism in the thought of Cusanus is well illustrated in a disquisition on the soul of the world. He completely rejects gradation between the "mind" and "soul" of the universe as explanatory of anything, and brings back all to the simplicity of the "one infinite form of forms," namely, God. Yet he cannot oppose

¹ Lib. ii., cap 5, p. 84.

² *Ibid.*, cap. 6, pp. 87-88.

³ *Ibid.*, cap 8, p. 94: "Quare possibilitas absoluta in Deo est Deus, extra ipsum vero non est possibile; nunquam enim est dabile aliquid per se, quod sit in potentia absoluta, cum omnia, praeter primum, necessario sint contracta".

the Platonists without praising the acuteness and rationality of their arguments and remarking (rather irrelevantly) on the unreasonableness of Aristotle's fault-finding.¹

This rejection of a Neo-Platonic distinction is not, as might perhaps be suspected, an accommodation to Christian theology; for Cusanus observes that many Christians have accepted the notion of a soul of the world as a power subordinate to God, and have tried to defend their position by Scripture.² The Cardinal's own doctrine is a more stringent monism. The forms of things, he says, are not distinct except as they are relative (*nisi ut sunt contracte*); in so far as they exist absolutely, they are all in one without distinction. "One infinite exemplar only is sufficient and necessary." It is true that we have to distinguish in the world the "reasons" of distinct things, but this has reference only to the things considered relatively (as "*contracta*"), not to the "one most simple reason of all things". There are no intermediate powers between the absolute and the relative.³ God alone is soul and mind of the world in so far as these are considered as absolute.

Yet Cusanus himself, in the next chapter, seems to bring in an intermediate power in another way; making of motion a kind of spirit of the universe serving as the "means of connexion of potency and act".⁴ "Nature is as it were a complex (complicatio) of all things that are done by motion." "This motion or spirit descends from the divine spirit." By it potency passes into act and act into potency. Mediating motion amorously connects all to unity, so that there may be one universe out of all. By this motion things, each unlike the rest, are moved to preserve themselves, if possible in a better state, and to preserve the species by union of the sexes.⁵ In this relative order there is no motion that is simply greatest; for the greatest motion coincides with rest (maximum with minimum).⁶ These positions Cusanus sums

¹ Lib. ii., cap. 9, p. 99. No doubt the editor is right in supposing that the reference is to Aristotle's criticism of the doctrine of Ideas.

² Cudworth, in fact, with his doctrines of a "plastic Nature" and so forth, still did this in the seventeenth century.

³ Lib. ii., cap. 9, p. 101: "*Solus enim Deus est absolutus, omnia alia contracta*".

⁴ *Ibid.*, cap. 10, p. 104.

⁵ He guards himself against the narrow teleological interpretations that subordinate one species of things to another. "Light," he says (ii., 12, p. 112), "shines from its own nature, not that I may see." The organic character of the universe, however, makes all serviceable to all.

⁶ As Bruno afterwards put the "relativist" view: to say that the universe as a whole is moving with infinite velocity would be the same as to say that it is unmoved.

up in one of his philosophical trinities; assigning to the Father potency, to the Son "act" or "form," and to the divine Spirit "unifying harmony" or "connexion by motion".

As the maximum and minimum of motion coincide, so do the circumference and centre of the universe. In the paradoxical phrases eagerly taken up by Bruno, centre and circumference are everywhere and nowhere. There is no perfect circle in nature, for a truer can always be given than any assigned one. No heavenly body ever returns to the same position or repeats its course with perfect exactitude as regards temporal order. These beginnings of the new astronomy have been indicated above. In detail, as the editor shows, Cusanus had predecessors,¹ though the new ideas quite logically follow from his metaphysics. A fermentation of scientific thought on astronomy, we perceive, had begun in the fifteenth century, which in the sixteenth was retarded for a time and in the early seventeenth received a severer check in the condemnation of Galileo. The very fact that the new cosmology grew in demonstrative force seems to have intensified the organised resistance to it till the breaking-point came.

Some of the ideas of Cusanus, I have suggested, point to a phase of thought later than that which ruled in the next movement of scientific astronomy, for which the "infinite universe" of Bruno became a sort of generally recognised philosophical completion. The world of physics, Cusanus says, though it is not infinite, yet cannot be conceived as finite, since it has no boundaries.² Elsewhere he calls it "finite" in a certain sense, that is, as opposed to the "absolute infinity" of its metaphysical principle. The worlds, though innumerable to us, were created "in number". This, however, does not modify his view that there is no absolute position or motion. The relativity of motion and position in general is stated with a completeness not exceeded even by Bruno.³

Treating finally of the place of the earth in the universe, he declares it impossible for us to know that it is the only

¹ See the long note to lib. ii., cap. 11, pp. 105-106.

² Lib. ii., cap. 11, p. 107: "Cum hic non sit mundus infinitus, tamen non potest concipi finitus, cum terminis careat, inter quos claudatur."

³ *Ibid.*, p. 109: "Complicata igitur istas diversas imaginationes, ut sit centrum zenith, et de converso, et tunc per intellectum, cui tantum docta servit ignorantia, vides mundum et eius motum et figuram attingi non posse, quoniam apparebit quasi rota in rota, et sphaera in sphaera, nullibi habens centrum vel circumferentiam, ut praefertur."

Of course Bruno would have applied this statement to his infinite universe: the difference is that Cusanus had in reserve the denial of infinitely extended matter and actually innumerable bodies.

realm of "corruption," as the Peripatetics taught. Corruption may be merely resolution into principles that still persist in various ways. The "forms" of things may migrate from one part of the universe to another,—that is, to other inhabited worlds. The material elements are resolved into one another, but this resolution does not take place without limit; the transformations always leave them in a certain proportion.¹ Before Bruno, Cusanus had completely turned away from the mediæval view that our earth is "vilissima et infima". To a spectator in another part of the universe, it would appear as a bright star. And it does not follow, because other worlds besides the earth are inhabited, that they are inhabited by nobler natures; for there can be nothing nobler in its kind than the intellectual nature of man.²

¹ Lib. ii., cap. 13.

² *Ibid.*, cap. 12, p. 113: "non enim appetit homo aliam naturam, sed solum in sua perfectus esse."

IV.—AN ENQUIRY INTO THE NATURE OF COLOUR ASSOCIATIONS.

BY T. K. SLADE.

THE PROBLEM STATED.

COLOUR preferences among children have received considerable attention: L. M. Baldwin, W. McDougall and C. S. Myers¹ have recorded experiments upon very young infants, whilst investigations of colour preferences among school children have been made by many people in a number of different countries. These appear, however, to have been made almost entirely from the point of view of preference merely, without any attempt to discover reasons for the preferences expressed.

The work of Lipps,² J. Volkelt,³ and J. Segal⁴ called attention to the degree to which the perceptive element affected appreciation, and consequently more attention has been paid to the "meanings" attached to simple perceptions. It is obviously impossible to investigate this directly in the case of infants, but J. Cohn,⁵ and E. Bullough⁶ have examined adults and investigated this aspect from the results of their subjects' introspections.

Bullough distinguishes four distinct perceptive attitudes which correspond with what he regards as four aspects of Colour. The type which he considers the highest æsthetically he has named the "Character Type"; his description of it brings into prominence certain points which bear upon the present enquiry. In speaking of this, the highest, type he says: "Its freedom from purely personal factors, from accidental memories and irrational associations, and its essentially emotional tone invest this type with a kind of objective reality, which is generally characteristic of æsthetic experiences, and stamps this form of colour-appreciation as

¹ *Br. Journ. Psych.*, vol. ii.

² "Ästhetische Einfühlung."

³ "System der Ästhetik."

⁴ "Über die Wohlgefälligkeit einfacher räumlichen Formen," *A. f. d. ges. Psych.*, 1906.

⁵ *Phil. Stud.*, Bd. x.

⁶ *Br. Journ. Psych.*, vols. ii. and iii.

the æsthetic appreciation *par excellence*". Such a description suggests that Bullough's "Character Type" owes more to congenital factors than to any associations peculiar to the individual and established during his life. Moreover, the paragraph quoted concludes a discussion in which he has insisted upon the fact that the degree of fusion between colour-impression and the associated content measures the legitimacy of the claim of any association-toned impression to be judged as an æsthetic factor. Now it would appear unlikely that any association established in the lifetime of an individual could attain that degree of fusion which might be expected of congenitally determined associations; and if any evidence can be found of the existence of such congenital associations, then on Bullough's reasoning we should expect to find them exceedingly potent in determining our attitude towards, and appreciation of Colour.

Without entering into speculations as to whether the dispositions of neurones or the structure of synapses could explain hereditary transmission of associations, without entering into the question of mechanism at all, it is possible to make investigations such as the experiment here recorded with a view to determining whether any evidence can be found of the existence of such congenitally determined associations.

Along many other lines may be found indications which suggest that a man possesses perceptual bias quite apart from his individual nature and in virtue of his racial heredity alone, but in whatever field we may seek to establish the existence of such factors it is clear that large numbers of observations must be made in order that they shall not be wholly obscured by differences due to individual heredity.

PROCEDURE.

To this end I planned the following test, and it has been applied to 323 boys of ages about 11 and 12 years, comprising seven classes in two Welsh and three English schools; also to 324 girls of about the same ages comprising eight classes, all from English schools. The total number of associations thus obtained is 9368.

The following instructions were sent to the schools, where the test was applied by the class teachers.

Please write on the B.B. the following list:—

Fear, Love, Danger, Rage, Anxiety, Rest, Sorrow, Safety, Self-confidence, Hate, Loneliness, Health, Sickness, Strength, Weakness.

And then, in a vertical column at the side of the B.B., the following colours :—

RED, YELLOW, BLUE, GREEN, BROWN, BLACK, WHITE.
Please instruct the children to head their papers with their full name (Christian and surname); Age (to the nearest year); Form or Standard, and School.

Next please instruct them that the colours are to be written in a vertical column at the left side of their paper and that each is to be underlined, also that two clear lines are to be left between each.

Please read to the class :—"On the Blackboard you will see a list of qualities. Some of these you know, and some of them, perhaps, you may not know at all. After the word RED on your papers I want you to write down those qualities in the list which you think *are* red, next after the word YELLOW those which you think *are* yellow, and so on until you have written against all the colours. Now listen : I will read these instructions again."

If a child should say (s)he can find nothing in the list fitting a particular colour please tell (her) him to leave it and go on with the next. Please give this instruction only to individuals, and only in the event of such a voluntary statement.

It would perhaps have been better if the test could always have been administered by the same person, but I found difficulty in getting to the schools at times convenient to the various headmasters and mistresses. I therefore tried to avoid the possible defects arising from this cause by means of the above explicit instructions, combined with interviews in which I emphasised the importance of the class teacher giving absolutely no advice or suggestion other than from the printed instructions. A far more serious criticism can be levelled at a test framed like this one, *viz.*, that by putting it in the form of a leading question an association between the qualities and the colours is suggested whilst no such association might exist naturally in the child's mind.

I gave considerable thought to this objection, but failed to find any other way of framing the test which was not open to more serious objections. Moreover, I have found since, especially in the case of adults, that without such a direct suggestion no results would have been forthcoming at all. I have presented the test to several adults who, on reading the sheet of instructions, have replied that they never associate with colours : I think their statement would have been correct

had they inserted the word "consciously," for when I then suggested that they should assign colours to the qualities at random I found no single case in which they did not perceive that certain associations would be *in-congruous*. Having observed this negative aspect they would then go on and, in some cases, produce a fairly full list of associations; some could only assert a positive association, or fittingness between a small number of the qualities and the colours, but I have not yet found anyone who failed to discover incongruities or, having done so, failed to find some positive relations. The children, of course, had no such encouragement and from those cases I have personally tried they do not need it; the associations appear to come to them far more readily than to adults and their replies are marked by an assurance which is generally missing in adults. Finally, if the leading nature of the test has induced children to reply where they had actually no association we can expect only random groupings from such instances which will be automatically discounted in the analysis of the results, since inferences have been drawn only where considerable congruity of choice has been shown.

The results were tabulated for each separate class to check the degree of uniformity between different schools.

At first I thought it desirable to reject papers in which such contradictory pairs as Strength-Weakness, Love-Hate or Sickness-Health were assigned to the same colour since they appeared to indicate that the child was unable to associate in this way; the intention was, however, abandoned owing to the slighter grades of apparent contradiction which made it difficult to draw a line. For example Strength-Anxiety or Strength-Fear may appear to be contradictory, but they correctly represent the reaction of a weakling who perceives "Strength" as another's strength and therefore as a fit cause of fear. Since this investigation is not concerned with interpreting any individual's associations, but rather with discovering those associations shared in common, I have included the whole of the associations collected and by considering only those which the tabulation shows to be backed by a strong congruity of choice have, I hope, discounted such as are the result of peculiar personal bias or random answering.

The following table gives the results collected from 323 boys:—

TABLE I.

	RED.	YELLOW.	BLUE.	GREEN.	BROWN.	BLACK.	WHITE.	
FEAR . . .	173	26	18	8	9	33	52	319
RAGE . . .	272	12	11	3	4	26	6	334
DANGER . . .	315	0	1	3	1	7	5	332
LOVE . . .	21	81	69	30	21	3	82	307
ANXIETY . . .	33	54	53	46	40	33	34	293
REST . . .	6	67	59	58	35	25	50	300
SORROW . . .	16	48	44	16	23	141	35	323
SAFETY . . .	10	21	34	167	21	4	22	279
SELF-CONFIDENCE	17	45	86	49	40	14	21	272
HATE . . .	109	39	40	25	27	85	8	333
LONELINESS . . .	7	63	41	26	58	61	37	293
HEALTH . . .	56	40	48	41	80	7	50	322
SICKNESS . . .	9	92	29	18	19	47	130	344
STRENGTH . . .	43	19	52	40	89	21	41	305
WEAKNESS . . .	7	69	33	22	18	40	147	336
	1094	676	518	552	485	547	720	4692

From this table it is apparent that certain qualities are associated with certain colours suffering only negligible competition from the other colours; some qualities show a double crest, and two colours take precedence of the rest; and some qualities show too uniform a distribution to allow of any judgment except, in some cases, that the quality is *not* commonly associated with some particular colour.

For more detailed examination the qualities are shown below with the associated colours arranged in order of precedence. The figures in the first column indicate the number of times the quality was associated with the particular colour, calculated as a percentage (to the nearest integer) of the total number of associations made with that particular quality. In the last three columns are given the number of times the colour achieved the first, second or third places in the seven separate classes examined. (In the case of Safety there are only six, as in one school this word was inadvertently omitted from the list on the B.B.)

		Per Cent.	1st.	2nd.	3rd.
Danger	RED	95	7	0	0
	BLACK	2	0	5	0
	WHITE	2	0	1	3
Rage	RED	79	7	0	0
	BLACK	8	0	6	1
	YELLOW	4	0	1	3
Safety	GREEN	60	6	0	0
	BLUE	12	0	3	1
	WHITE	8	0	1	2
Fear	RED	54	7	0	0
	WHITE	16	0	3	1
	BLACK	11	0	3	1

		Per Cent.	1st.	2nd.	3rd.
Weakness	WHITE	44	7	0	0
	YELLOW	19	0	5	2
	BLACK	12	0	2	1
Sorrow	BLACK	44	6	1	0
	YELLOW	15	1	1	2
	BLUE	14	0	3	2
	WHITE	11	0	2	1
Sickness	WHITE	38	5	2	0
	YELLOW	27	2	5	0
	BLACK	14	0	0	6
Hate	RED	33	4	1	1
	BLACK	26	1	6	0
	BLUE	12	0	0	4
Self-confidence	BLUE	32	7	0	0
	GREEN	18	0	2	3
	YELLOW	17	0	3	1
	BROWN	15	0	2	1
	WHITE	8	0	0	1
	BROWN	29	5	2	0
Strength	BLUE	17	1	3	1
	RED	14	1	2	1
	WHITE	13	0	1	1
	GREEN	13	0	0	4
	WHITE	27	3	2	2
Love	YELLOW	26	2	3	0
	BLUE	22	2	1	3
	GREEN	10	0	1	1
	RED	7	0	0	1
	BROWN	25	4	1	0
	RED	17	1	0	4
Health	WHITE	15	0	3	0
	BLUE	15	1	2	0
	GREEN	13	0	0	2
	YELLOW	22	2	3	1
	BLUE	20	2	1	1
Rest	GREEN	19	2	0	1
	WHITE	17	1	1	1
	BROWN	12	0	1	2
	YELLOW	18	2	0	2
	BLUE	18	3	1	1
Anxiety	GREEN	16	1	2	0
	BROWN	14	0	3	2
	WHITE	11	1	1	0
	BLACK	21	0	3	3
	YELLOW	21	4	0	0
Loneliness	BROWN	20	1	3	2
	BLUE	14	1	0	1
	WHITE	13	1	0	1

In considering these figures it must be remembered that there are at least two factors affecting the associations, in addition to the one whose existence we suspect and for evidence of which we are seeking. First of these is the *Currently Accepted Convention*. Thus red and green signal lights with their associated meanings must be familiar to most children; again, black for mourning, although not so obvious since the War as formerly, can hardly fail to affect their associations with Sorrow. Of these accepted valuations more will be said later; at the present it is sufficient to bear in mind that their influence must be considered in judging the results.

The second factor is that of *Historic Association*. In records of experimental work on the appreciation of colour references can nearly always be found to its influence; thus a colour may be disliked because it was the favourite dressing colour of a teacher who was disliked and so on. It is very important to realise that such associations can continue operative long after the original cause has been forgotten: that is to say our conscious colour preferences in such cases are modified, if not determined, by an element operating from below the threshold of consciousness. C. W. Valentine notes this fact thus:—"Experiments have shown that we may have a feeling similar to those we experienced when we saw a given object, even when the object itself is not recalled. Thus we cannot necessarily conclude that vague associations are not at work when a colour pleases us merely because we cannot trace them."¹ Since the effect of such "historic associations" will be individual it will obscure the manifestations of any tendency shared in common, and consequently we must be prepared to pay so much the more attention to any congruities of choice which cannot be referred to the "conventional" associations.

Two colours, Black and White, stand in a class apart in that they have achieved a widely, one might almost say universally, recognised value on a moral plane. This valuation is of a more symbolic nature than the conventional recognition of Red for danger and Black for mourning. Black is thus associated with evil and White with the reverse and, remembering the methods of applause and condemnation by which the child is encouraged in the development of its *ego-ideal*, we can realise that the child-mind would probably equate Black with "nasty" and White with "nice".

Let us now consider the qualities in order of the degree of uniformity of choice expressed in the associations.

¹ *Psychology of Beauty*, p. 19.

DANGER. The associated colour in this case is RED, to the exclusion of all competitors. It occupies the first place in all seven classes, and BLACK, which in five cases holds the second place, can claim only 2 per cent. of the total marks. The exclusive use, in our country, of red lights and red flags for the purpose of warning might at first sight appear sufficient explanation of this preponderating 95 per cent., indeed one might be inclined to regard this figure as a measure of the strength of "Conventional Association". Such a view, however, would leave unexplained why this colour came to be chosen for this purpose not only in our own country but throughout the world. Moreover, BLACK is accepted in this country as indicating mourning quite as strongly and as frequently as RED for danger, yet the distribution of choice in that case (44, 15, 14, 11 per cent.) contrasts markedly with the figures for danger (95, 2, 2 per cent.).

If we regard 95 per cent. as measuring the power of "Conventional Association" we have to explain how it is that in the case of sorrow other factors, such as "Historic Association," can override its influence so much more markedly than in the case of Danger; while if we regard 44 per cent. as a probable measure we shall then have to explain the excessively high figure for Danger. Since I have already set aside for further consideration the problem of explaining why RED has been selected as the colour of warning in nearly all countries, I am inclined to adopt—tentatively—the latter position; for any considerations explaining the former problem would equally apply to the present question.

RAGE. The exceedingly strong preponderance of RED in association with Rage is still less explicable; "Conventional Association" does not help us here as formerly. The phrase "white with rage" is sufficiently common—far commoner indeed than the observation of a person in that condition—yet WHITE has only a bare 2 per cent. of the associations with this quality; the highest it appears at all is third, and that in one class only. We have as yet no observations which will throw any light on this strong uniformity of choice and must leave the question for later consideration.

SAFETY. Though in the case of railway signals GREEN stands for safety just as strongly as does RED for danger, yet we must remember that in other circumstances in which Red is commonly seen as a warning signal (lights on vehicles, flags, fire-engines) the antithetic Green is absent. We might therefore expect an even greater drop than there is in fact, if we attribute the high degree of uniformity in the former case chiefly to the children's familiarity with red lights. In addi-

tion it is probable that Danger will be more strongly externalised in the child's mind than will safety; the latter will mean not so much an external as an internal condition, or state of a comfortable nature associated with the idea of protection. Safety will thus be more strongly linked in the child's mind with personalities, while Danger will connect itself with objects, animals and situations fraught with menace. If safety becomes in this way bound up with protecting personalities, it is likely that we shall in this case find a greater proportion of those "Historic Associations" so commonly linked with a well-known person than we should in the case of Danger. The difference is possibly slight, but whatever weight it may have will tend toward the *generalising* of the associations and the distributing of the children's choice amongst the other colours.

If we consider the relative prevalence of GREEN as a sign of safety and BLACK as a sign of mourning and then compare with the 60 per cent. and the 44 per cent. gained respectively by GREEN and BLACK in these connexions, it will certainly appear that the 60 per cent. is higher than would be expected from the familiarity of its appearance as an emblem of safety. Here therefore, as with RED, we must suspect the operation of a factor not yet considered, and one more or less independent of individual experience and environment.

FEAR. Again we find RED a strong favourite, but whereas previously the runners up scored only 2 per cent. and 8 per cent., in this case the second favourite, WHITE, rises as high as 16 per cent. In the great bulk of the papers where Fear is recorded as RED, Danger has just preceded it under the same colour, and we may perhaps explain the choice by a more or less verbal association with Danger. It is certainly understandable that a child having just written Danger against the colour RED would, on looking again at the list, be struck by the kinship between Fear and Danger and, lacking any strong colour association with Fear, would assign it to red on the grounds of this kinship.

One may suspect the traditional ghost as contributing to the strength of the second choice, but it is well to remember also that children commonly go pale when frightened and, as we shall see later, bodily appearance is responsible for a considerable number of the associations. With regard to the third choice, it is hardly necessary to point out that children's fear of the dark can hardly fail to account for many of the cases in which BLACK was assigned to Fear.

SORROW. It must certainly be admitted that, in this country, BLACK is the conventionally accepted colour for mourning

and, seeing that the symbolic valuation of that colour, by which it is equated with evil things, would tend to raise the percentage rather than to lower it, we may tentatively regard 44 per cent. as the probable limit of "Conventional Association". The next two colours, YELLOW 15 per cent. and BLUE 14 per cent., present a difficulty. It seems hardly likely that the effect of "Historic Association" should produce such congruence from different children as to account for this relatively high percentage, especially in contrast with GREEN and the apparently more eligible BROWN. WHITE, 11 per cent., one could have better understood from association with funeral flowers, shrouds and tomb-stones, but it may very well be that such tendencies were counteracted by the symbolic valuation equating this colour with good and pleasant things. Consideration of the figures for this quality suggest that the strength of "Conventional Association" is decidedly less than one would have been inclined to expect.

WEAKNESS AND SICKNESS show most marked similarities and appear to have been regarded by the children as synonymous terms. WHITE, with 44 per cent. and 38 per cent. respectively, shows a position as strong as that of BLACK for Sorrow. This appears a little surprising, but the fact must be carefully noted as marking the child's tendency to evaluate colours in terms of physical appearance. The comparatively few adults I have been able to test do not show this nearly so strongly, with them BLACK takes precedence of WHITE in this connexion: but the child is more occupied with the physical appearance of pallor than with the more remote concomitants of sickness which the adult (the one with responsibilities) symbolises by BLACK.

That the child is not indifferent to such considerations is indicated by BLACK achieving the third place in the list, or again this may merely represent that sickness is "nasty". The position of YELLOW as second favourite is not explicable, unless we regard it as a closer description of the actual hue of a sick person's face. This seems hardly adequate and the point must be left for further enquiry.

HATE. In this case the second colour challenges the first far more strongly than any previously: RED 33 per cent., BLACK 26 per cent. The challenge is still more apparent when we consider the positions achieved in the seven classes examined:—RED, four firsts, a second and a third, BLACK, one first and six seconds. It is evident that the replies have been based upon two different views, one of which assigns RED very definitely as the colour associated with Hate, while from the other point of view BLACK is almost as decisively

the correct emblem. Now Hate does not produce any commonly recognised colour change in the complexion; the external appearance of lowered brows or retracted lips can hardly suggest RED, but possibly the general appearance of scowling may have influenced the choice of BLACK. "Black looks" is a sufficiently common phrase, and in conjunction with the fact that hatred is a fit subject for reproach might account for that colour. But what of the equally strong, indeed rather stronger, RED? No explanation appears forthcoming upon lines of "Conventional Association" and we cannot refer such uniformity of choice to the accidental agreement of individual "Historic Association". It would therefore seem that we have here again an instance of the operation of some other factor, and the point must be set aside for later discussion.

SELF-CONFIDENCE. Though the first colour, BLUE, scores only 33 per cent., yet it is nearly double that scored by its competitors which follow in a bunch. Its position, too, in the separate classes, namely first on every occasion, warrants us in regarding this as an unequivocal choice. What explains this choice is not clear; "Conventional Association" gives us little lead at all, and amongst such phrases as "To have the blues," "Blue blood," "An old Blue" there is little to be found that is apropos, apart from the fact that it is rather unlikely for these particular phrases to be operative among these children. It is not at all likely that "Historic Association" could produce such uniformity, indeed it is to its influence that we must attribute the very uniform distribution among the succeeding colours. This case must again be left as a query.

LOVE. Here three colours appear in close competition, viz., WHITE, YELLOW and BLUE with 27, 26 and 22 per cent. respectively. The distribution of the places, too, makes it clear that we cannot assign the position of favourite to either colour. WHITE may very likely owe its position to the symbolic valuation spoken of before, especially as BLACK scores less than 1 per cent. In the bulk of the papers Love is assigned to the same colour as Weakness, and the position of YELLOW under that quality may be related to its appearance here. It is, perhaps, understandable that boys would antithesise Love and Strength, being apt to regard emotional manifestations askance, but if this be so it merely indicates that the children were dealing with a subject which has not yet attained to any degree of reality for them. The operation of "Historic Association" would be likely to dominate the field in relation to this quality and may account for the

grouping. No conclusion can be drawn except that for these children Love is *not* BLACK.

STRENGTH AND HEALTH. Here, as in the case of Weakness and Sickness, we find very close agreement. Amongst the children BROWN appears as first favourite with 29 and 25 per cent. respectively; among those adults I have been able to test I have not found this same preference for BROWN. The WHITE commonly given by adults corresponds to their BLACK for Sickness, and for similar reasons; while the children's BROWN again emphasises the fact that their attention is centred upon the external appearance of Health. It is noteworthy that the runners-up in Sickness (YELLOW and BLACK) do not appear even in the next four colours, and the inclusion of WHITE is clearly referable to its symbolic valuation. The comparison of these four qualities indicates that the results we are examining are distinctly self-congruent, and that the efforts to analyse their meaning are not being spent upon accidental or worthless associations.

REST, LONELINESS AND ANXIETY exhibit grouping too close to allow of any judgment being made other than that REST and LONELINESS are distinctly *not*—RED.

With a view to detecting any differences which might possibly exist in virtue of sex, the girls' associations have been collected separately. The following table gives the summarised results:—

TABLE II.—(324 GIRLS).

	RED.	YELLOW.	BLUE.	GREEN.	BROWN.	BLACK.	WHITE.	
FEAR . . .	170	44	16	12	8	26	28	304
RAGE . . .	231	24	3	11	7	34	3	313
DANGER . . .	314	2	0	0	0	4	0	320
LOVE . . .	13	39	135	13	8	3	97	308
ANXIETY . . .	23	100	42	35	47	29	28	304
REST . . .	3	35	75	32	22	30	111	304
SORROW . . .	8	43	41	12	20	168	28	320
SAFETY . . .	8	24	45	194	16	6	25	318
SELF-CONFIDENCE	9	44	89	77	51	17	18	305
HATE . . .	86	51	12	32	22	111	0	314
LONELINESS . . .	2	43	48	33	59	91	33	309
HEALTH . . .	56	25	52	42	75	7	54	311
SICKNESS . . .	5	71	12	10	27	57	139	321
STRENGTH . . .	26	26	46	49	107	12	39	305
WEAKNESSES . . .	6	56	18	10	24	30	172	316
	960	627	634	562	493	625	775	4676

A comparison with Table I. will show that amongst the girls' results are to be found more very low, or very high

numbers. The better agreement thus denoted would seem to indicate that girls "understand" the test better; that this form of association comes rather more naturally to them than to the boys.

		Per Cent.	1st.	2nd.	3rd.
Danger	RED	94	8	0	0
	BLACK	1	0	3	0
Rage	RED	72	8	0	0
	BLACK	11	0	6	1
	YELLOW	8	0	2	5
Safety	GREEN	61	8	0	0
	BLUE	14	0	6	1
	WHITE	8	0	1	3
	YELLOW	8	0	1	2
Fear	RED	56	8	0	0
	YELLOW	14	0	5	1
	BLACK	9	0	3	1
	WHITE	9	0	0	6
Weakness	WHITE	54	8	0	0
	YELLOW	18	0	5	2
	BLACK	10	0	3	2
Sorrow	BLACK	53	8	0	0
	YELLOW	13	0	4	4
	BLUE	13	0	3	2
	WHITE	9	0	1	1
Love	BLUE	44	7	1	0
	WHITE	31	1	7	0
	YELLOW	13	0	0	5
	RED	4	0	0	2
	GREEN	4	0	0	1
Sickness	WHITE	43	7	1	0
	YELLOW	22	1	4	3
	BLUE	18	0	3	5
	BROWN	8	0	0	0
Rest	WHITE	36	7	1	0
	BLUE	25	1	5	2
	YELLOW	12	0	1	2
	GREEN	11	0	0	3
Strength	BROWN	35	8	0	0
	GREEN	16	0	3	2
	BLUE	15	0	4	1
	WHITE	13	0	1	3
Hate	BLACK	35	6	1	1
	RED	27	2	4	1
	YELLOW	16	0	2	3
	GREEN	10	0	0	2

		Per Cent.	1st.	2nd.	3rd.
Anxiety	YELLOW	33	8	0	0
	BROWN	15	0	3	3
	BLUE	14	0	2	2
	BLACK	9	0	1	1
	WHITE	9	0	0	2
Loneliness	BLACK	29	6	0	0
	BROWN	19	1	4	2
	BLUE	16	0	2	1
	YELLOW	14	0	1	2
	GREEN	11	0	0	3
	WHITE	11	1	1	0
Self-confidence	BLUE	29	4	3	1
	GREEN	25	4	1	3
	BROWN	17	0	2	3
	YELLOW	13	0	2	1
Health	BROWN	24	3	2	2
	RED	18	0	4	3
	WHITE	17	1	1	2
	BLUE	17	2	1	0
	GREEN	13	2	0	0

In comparing these results with those from the boys' papers, it is satisfactory to note that in three cases only do they show any divergence of opinion as to the colour which stands first.

Girls assign BLUE to Love while boys made it WHITE (the second colour in the girls' list), but we have already seen that the distribution of the figures in the boys' list indicates that the quality has little interest for them. Their common bracketing of it with Weakness implies a contemptuous attitude which is not at all surprising; the girls, on the other hand, more commonly bracket it with Strength, and not uncommonly with Fear and Danger. The latter combination occurred chiefly among the older girls, and in the one instance in which I was able to discuss the results with the headmistress it was made abundantly clear that such associations threw considerable light upon the girls' characters.

In the girls' papers Rest rises to a comparatively high place (as judged by uniformity of choice) whereas with the boys the figures were so uniformly distributed as to preclude any judgment. This is not difficult to understand, for girls are far more likely to heed their mother's outcries about the unendingness of woman's work, of their desire for rest and their inability to obtain it. Rest thus becomes of greater interest to the girl than to the boy; and the choice of WHITE probably reflects symbolic valuation, and merely designates

Rest as "something nice," though it is probable that the girl herself feels little actual longing for it.

Hate, in the girls' papers, is adjudged to BLACK, whereas the boys assigned it to RED (with BLACK a fairly good second). In this, as in several other instances, we see an indication that girls are more apt to refer to the symbolic valuation of BLACK and WHITE than are boys.

With these three not at all inexplicable divergencies the list is complete; in all other cases the first choice falls on the same colour, and in many cases agreement is shown amongst those occupying the lower places. This is encouraging, since it indicates that we are dealing with data sufficiently constant to warrant consideration.

The remarks upon the separate qualities in respect to the boys' papers are nearly all applicable to the girls'. In the latter we must, however, notice a considerable rise in the figure for BLACK in connexion with Sorrow. The former figure which we tentatively assumed to represent the probable limit of the effect of "Conventional Association" may need to be raised; but, as was previously noted, that figure was to be understood as including those choices determined by the symbolic valuation of BLACK, and girls seem more prone to this form of association than do boys.

The only additional comments arising from the girls' papers is the presence of YELLOW as second choice in Fear and third in Hate. Love, in this list, has a colour assigned to it (BLUE) whereas in the previous list no judgment could be formed.

ASSOCIATIONS REQUIRING EXPLANATION.

The points arising out of the boys' papers which were set aside for further examination were the following: The association of RED with Rage seems closer than can be easily attributed to the physical appearance of people under the influence of that emotion; the association of RED with Hate seems still more obscure; the exceedingly high figures for RED in association with Danger seem to indicate the operation of some factor other than "Conventional Association," and we have at the same time to attempt some explanation of the fact that this colour has been selected as the colour of Warning in all countries.

The next point which demanded enquiry was the very high score for GREEN in association with Safety; just as for RED with Danger, it appears higher than can be accounted for by "Conventional Association".

The association of BLUE with Self-confidence was left unexplained.

The position of YELLOW as second favourite in Sickness and Weakness, though no doubt largely determined by the complexion of sick people, seems rather high and perhaps worth investigation, especially as other indications exist showing that it is often regarded as a "nasty" colour. Its position as second in the case of Sorrow certainly cannot be attributed to physical appearance.

All the above-mentioned points occur in the girls' papers as well, and in addition BLUE stands a good first for Love.

The question with regard to YELLOW is emphasised by the fact that it is second for Fear, while Anxiety, which in the boys' papers showed figures too nearly equal to permit of any judgment being made, is here definitely assigned to YELLOW.

CONCLUSIONS.¹

When we have set aside those associations due to cultural experience (Red for Danger—Black for Sorrow and so on) which comprise those most obviously explicable, and with these put those due to the symbolic meanings attached to Black and White, and when, too, we have neglected those in which lack of general agreement suggest the operation of "Historic Association," we find left a residuum in which the uniformity of choice precludes the possibility of chance.

This appears to indicate the operation of a factor of a racial character, quite independent of individual experience.

The development of such phenomena can be explained by the theory that *when affective relations have been set up with coloured objects, at a stage before language was sufficiently advanced to achieve the abstraction of an adjectival colour-name, then objects which later became classified as being of that colour became tinged with the affective tone belonging to the earlier members.*

No claim, can, of course, be made to have established the existence of this process; but since its operation would have resulted in the facts as we now find them, it is legitimate, in the absence of any better established theory, to refer to this one and even to extend it tentatively to other realms.

¹ [In his original paper the author had included some detailed suggestions in support of these conclusions, which have been here omitted owing to their length and highly speculative character.—EDITOR.]

V.—DISCUSSION.

A NOTE ON SOCRATES AND ARISTOTLE.

PERHAPS the weightiest single reason for holding to the usual opinion about the relation of Socrates to the Platonic philosophy, is what is taken to be the testimony of Aristotle to the effect that Socrates was concerned only with definitions and inductive inquiries, and did *not* believe in the existence of separate Ideas, which last heresy was due to Plato. There are various ways of meeting this which might be adopted by those who think that a case has been established, by Professors Burnet and Taylor in particular, for accepting Plato's own portrait of Socrates as containing a substantial measure of truth. As a last resort it is always possible to fall back on the supposition that Aristotle is mistaken, and was not sufficiently acquainted with the facts. This is not an altogether satisfactory solution. But it is not an impossible one provided a strong enough positive case can be made out for the thing that Aristotle denies; and at least it cannot be dismissed off-hand by critics who urge that Aristotle has blundered egregiously in describing the ideal theory of his own teacher Plato.

A line of attack somewhat more satisfactory would be through a re-interpretation of Aristotle's evidence. And, as a matter of fact, there are difficulties connected with this apart from any particular thesis that one may desire to see emerge. Doubtless to the modern reader it will seem natural to take the statement as if it meant that Socrates regarded the universal simply in a conceptualistic sense; but the historical presumption is on the whole against this. The original approach of the Greek mind to the problem of the universal was realistic rather than psychological; for the Pythagoreans the number theory was understood in a thoroughly realistic way, and everywhere in Plato it is evident that the realistic point of view is regarded as so obvious as hardly to need argument. It would accordingly be possible to suppose that the statement about the separateness of the Idea has reference, in the case of Socrates just as in Aristotle's similar statement about the Pythagoreans, not to a denial of realism, but simply to a failure to recognise explicitly any residuum of sense over and above the ideal elements which constitute the reality of the phenomenal world—perhaps because Socrates had not thought his way far enough into the ideal theory to realise the problems involved. It is certainly worth noting that, in *Met. A*, Plato's innovation is said to consist in the fact, not that

he made Ideas exist apart from sensible things by hypostasising concepts, but that he made sensible things exist apart from 'real' universals, and thus only indirectly 'participate' in reality.¹

The case would be still stronger if we could follow Professor Burnet also in the supposition that what Aristotle in *Met. M* has to say about 'those who first maintained the existence of Ideas' is meant to apply, not to Plato at all, but to the contemporary Socratic group in the *Phædo*.² It is a strong argument in favour of this that, as he points out, Aristotle expressly distinguishes the theory he is here examining as an early theory not connected with the nature of numbers; and this certainly cannot apply to the doctrine which he commonly attributes to Plato. Similarly he speaks of certain consequences which follow for these early Idealists, but which the Platonists denied.

Nevertheless it is not easy to avoid the impression that the dictum about Socrates³ puts a real, though not necessarily a fatal, difficulty in the way of this thesis. For what is stated here about those who first said that there were Ideas has previously in *Met. A* been said explicitly of Plato; and one would not naturally have expected to find the same statement made of different persons without some explanation. Furthermore, it is not quite easy to be sure of the meaning of the passage in this new reference. There is some trouble in supposing that, prior to Plato, the metaphysics of the ideal theory had been worked out sufficiently to develop a sharp difference of opinion between Socrates and his Pythagorean associates (certainly we should not gather this from the *Phædo*); while if we do think that Socrates' position is being contrasted with a clearly conscious early theory of separation of a very extreme type,⁴ we have to meet the objection that the separation is not only attributed in the two contexts to different persons, but that it will have to bear a different meaning here from the one given to separation in *Met. A*. It appears to me that a more drastic remedy is needed to remove this difficulty.

As an approach to this, it is necessary to examine first the earlier passage.⁵ After dealing briefly with the Pythagoreans, Aristotle here proceeds to give a relatively clear and straightforward account of the connexion between them and Plato—a close connexion on the whole, though there are several points of difference. From Heraclitus Plato had got the recognition that sensible things are in a state of flux, so that no knowledge of them is possible. From Socrates he derived the insight that knowledge is concerned with definitions or universals. Socrates himself, however, had been interested only in ethical universals; it was Plato who turned the method into a general theory of knowledge, and by combining the two doctrines

¹ *Met. A*. 6, 987 b, 8.

² *Greek Philosophy*, pp. 157, 313. Cf. pp. 165 ff.

³ *Met. M*. 4, 1078 b, 30.

⁴ Cf. Taylor, *Varia Socratica*, p. 81 ff.

⁵ *Met. A*. 6.

was led not merely to postulate a world of Ideas as the true object of knowledge, but to separate the sensible world from this as having an existence for knowledge only through 'participation' in the Forms. As regards this relationship of participation Plato did not differ from the Pythagoreans, except in using a different term to express it. He also agrees in saying that the Numbers are the causes of the reality of other things. His differences lay in introducing the objects of mathematics as intermediate between sensible things and the Forms; in his theory of the Dyad; and in his view that the Numbers exist apart from sensible things, whereas the Pythagoreans say that the things themselves *are* Numbers.

It would appear, then, that in this earlier passage Aristotle has no primary intention of contrasting Plato with Socrates when he speaks of the separation of the Ideas. The first statement which he makes to this effect *might* conceivably have Socrates in mind, but hardly on the most probable interpretation. Socrates appears to be introduced merely to explain Plato's acceptance of the method of definition; the thought then goes back to the problem of knowledge raised by Heracleitus. That this is not Socrates' problem is indicated by the fact that Socrates has just been said to have confined his interest to ethics, and to have ignored general questions about the physical or 'sensible' world. And a little further on Aristotle expressly names the Pythagoreans as those from whom Plato differed on the question of the separateness of the Ideas.

We need to have this relatively clear account in mind, then, in turning to the second passage in *Met. M.*¹ In a general way this seems to be modelled on the basis of the passage in A; but the sequence is much more confused. It sets out as a criticism of the ideal theory rather than as an historical account of it. In both cases, however, a reference to the Heracleitean doctrine is followed by remarks about Socrates; and while these remarks are considerably more extended in M, they lead in the same way to an implied condemnation of 'those who first maintained the existence of Ideas' for giving to Ideas a separate existence. It is here that the special dictum about Socrates appears. The passage then goes on with a critical attack such as the opening sentence would lead us to expect.

It does not take a very careful reading to become aware that the reference to Socrates in this section has a far less natural setting than in the earlier one. The transition comes indeed as a distinct jolt; and this jolt is not lessened on a more careful analysis. Why, when we are already launched on an account—according to the ordinary view—of Plato's theory, should we turn back suddenly to his predecessor? An interest primarily historical, as in A, might furnish reason for this; but here it is the critical interest that is uppermost, and the reference adds nothing to the argument. In the first place it is a digression from criticism to historical appreciation, and to an appreciation, furthermore, in terms of scientific methodology rather than of a metaphysics of the ideal theory, with

¹ *Met. M.* 4.

which the rest of the passage is concerned. It is true that the Socratic episode turns to metaphysics at its close. But even then the relevance to the argument is not apparent. Those who first maintained Ideas, the passage runs, gave them separate existence; therefore it followed for them, almost by the same argument, that there must be Ideas of all things that are spoken of universally. But why should such a conclusion follow from the fact that the Ideas are separate? What it might be thought to follow from is the sentence which immediately precedes the Socratic digression—that if knowledge is to have an object, there must be other and permanent entities apart from those which are sensible; the point would then be that the Ideas, not because they are separate, but as the permanent elements present in the sensible world, must exist wherever such common elements are to be discovered.

It seems to me a probable hypothesis, therefore, that this last represents the original connexion, which would leave the section throughout what at the start it promises to be—the criticism of a doctrine whose historical antecedents have already sufficiently been explained. But some editor, it may be conjectured, finding himself with a detached note about Socrates' contribution to scientific method, hit upon this as a good place to insert it, since he recalled a former passage where a reference to Socrates' method had followed one to Heraclitus. To fit this note in, he supplied an introduction and conclusion. Both are obviously reminiscent of the former section, though the rest of the passage is new matter; and in both cases an alien hand is not difficult to trace. The introduction shows the familiar signs of a textual influence, as distinct from independent writing, by the use of the words of the earlier and more extended passage in a different grammatical connexion, and with a somewhat different and less appropriate meaning.¹ And in the conclusion the case is still clearer. The editor has to bring the narrative back from methodology to his text; and he does this by repeating Aristotle's complaint that Plato gave the Ideas separate existence. But in doing so he falls into a misunderstanding, and interprets the failure to separate the universals as referring to Socrates, whereas this was originally said by Aristotle not about Socrates, but about the Pythagoreans, and in a sense which he clearly explains. Its reference to Socrates, on the contrary, can carry at best a very uncertain meaning. It is true that a little later Aristotle is made to repeat incidentally the same reference to Socrates.² But if the origin of the first statement is as has been suggested, there is no trouble in attributing the repetition also to the same hand, especially as it refers back to the earlier passage as its original.

¹ Σωκράτους δὲ περὶ μὲν τὰ ἠθικὰ πραγματευόμενον, περὶ δὲ τῆς ὅλης φύσεως οὐδέν, ἐν μέντοι τούτοις τὸ καθόλου ζητοῦντος καὶ περὶ ὁρισμῶν ἐπιστήσαντος πρώτου τὴν διάνοιαν, A. 6, 987 b, 1-4. Σωκράτους δὲ περὶ τὰς ἠθικὰς ἀρετὰς πραγματευόμενον καὶ περὶ τούτων ὀρίεσθαι καθόλου ζητοῦντος πρώτου, M. 4, 1078 b, 17-19.

² Met. M. 9, 1086 b, 2.

It remains to note briefly the bearing which this elimination would have upon the identification of those who first said there were Ideas. It may be taken as almost certain that this early theory is the same as that which is presupposed in the *Phædo*, and that it differs in important particulars from the one which, according to Aristotle, was taught consistently by Plato in the Academy. There is an alternative, however, to supposing that it therefore could not have been Plato's; Aristotle's words *might* refer to an early form in which Plato's own doctrine was cast. In favour of this would be the fact that Plato is elsewhere said to have come to the theory by the same Heracleitean path that is here attributed to its originators; and, in general, while some of Aristotle's criticisms clearly refer to the *Phædo*, the reader hardly gets the impression anywhere that he is confronting in different passages two entirely different sets of antagonists. I see no real necessity, however, for choosing between the alternatives. In view of the reasons Professor Burnet has adduced, there seems no good ground for supposing that the ideal theory represented in the *Phædo* was not in its general outlines actually held by Socrates, and that Aristotle consequently did not mean to include both Socrates and his associates among 'those who first maintained the existence of Ideas'. But also I see no need for refusing to suppose that Plato himself was in an earlier period a Socratic, and that Aristotle therefore may not have thought of him, too, as in a sense a member of the group which he introduces in a way so almost studiously indefinite. It would appear indeed to have been from the less developed form of the doctrine that Aristotle gets a good share of his evidence for Plato's separation of the Ideas; and this may very well have predisposed him to continue to find difficulties in the maturer theory which, in view of Plato's change of emphasis, would not otherwise have loomed as large.

A. K. ROGERS.

VI.—CRITICAL NOTICES.

Experience and Nature. By JOHN DEWEY. Chicago: London, Open Court Publishing Co., 1925. Pp. xi, 443.

THIS is the first series of lectures upon the Paul Carus foundation, and it goes without saying that the American Philosophical Association honoured itself as well as the foundation when it selected Mr. Dewey to give them. He has a better title than any other philosopher to inaugurate this important series across the Atlantic; and he has given us of his best in this volume. Moreover, he has supplied full measure. The ten lectures which compose this book are each upon a scale which could scarcely be compressed within a normal lecturing period, and together form a systematic treatise upon a most fundamental theme. It is to be hoped that subsequent lecturers upon the foundation—in all probability, the lectures will be bi-ennial—will follow this admirable practice; and, in any case, it is fortunate for the world of philosophy that Mr. Dewey should have been able to give us so adequate an exposition of his mature opinions.

Mr. Dewey scarcely concerns himself in these pages with any very formal definition of Nature. He is more interested in the adjective 'natural' than in any omnivorous substantive; and, being assured that nothing can truly be non-natural, he endeavours to exhibit in outline the natural status of all we can ask or think. Means have their instrumental place, ends (relatively speaking) their consummatory place, humanity its human place, art and beauty their artful or æsthetic station. And Mr. Dewey's method is the critical exploration of experience taken 'with the utmost of naïveté and catholicity'. "The whole wide universe of fact and dream, of event, desire, fancy and meanings, valid or invalid" is Nature; and its opposite is, quite precisely, nothing at all. Ultimately, experience signifies *denoting*; and the method of a philosophy which is piously denotative (instead of being a sectarian empiricism) is to follow all that is denoted wherever it is and works. Accuracy and fulness of denotation is all we should ask; and of everything we have to say, in the end, *solvitur monstrando*.

Experience, then, is pointing; and everything discovered through pointing is a point that Nature makes. Nature includes experience—and entirely naturally. Since certain philosophers maintain, however, that experience includes Nature—and entirely experientially—we might, perhaps, be curious to know what Mr. Dewey

would make of this distinct but tenaciously asserted proposition; and personally I must confess that I find a puzzle here. It is plain, indeed, from Mr. Dewey's statements, that when 'experience' is qualified as 'conscious,' 'personal' or 'finite' it is *not* coextensive with Nature, but it does not seem to be quite so plain what he takes experience to be when it is qualified in none of these ways. "Experience when it happens," we read, "has the same dependence upon objective natural events, physical and social, as has the occurrence of a house. . . . In first instance and intent, it is not exact nor relevant to say "I experience" or "I think". "It" experiences or is experienced, "it thinks" or "is thought" is a juster phrase. Experience, a serial course of affairs with their own characteristic properties and relationships, occurs, happens, and is what it is. Among and within these occurrences, not outside of them nor underlying them, are those events which are denominated selves. In some specifiable respects and for some specifiable consequences, these selves, capable of objective denotation just as are sticks, stones, and stars, assume the care and administration of certain objects and acts in experience" (pp. 232-233). This sounds, in every distinctive way, as if it were the common sense distinction between things which confront our experience, and our experience of them. If so, there may have been things in nature of which, at some given period, neither "they thought" nor "they were thought" could, in any sense, be justly said. Indeed, we are frequently informed that what is true of 'experience' need not be true of the objects of experience. Thus on page 219 we are told that "there is a contrast between physical objects and objects as they are believed to be, even though what they are believed to be is an unescapable medium in observing what they are". On page 29, again, we read that 'the legitimacy of timeless absorption is no argument in behalf of the legitimacy of timeless objects'. Why, then, should we be debarred from holding that much in nature consists of non-experiences? And what is the plausibility of Mr. Dewey's fundamental premiss that "the key to the trends of nature is found in the adjectives that are commonly prefixed to experience. Experience is political, religious, æsthetic, industrial, intellectual, mine, yours" (p. 15)?

In short, the 'key,' it is explicitly stated, sometimes may not fit. Nevertheless, all we can do is to try it—and, I suppose, try it out. In bare outline, indeed, the gist of Mr. Dewey's assertions here would appear to be that 'experience' *denotes*, in some fashion, anything that, in any fashion, may be experienced, and that, when it itself is experienced, it denotes itself. This principle would certainly distinguish Mr. Dewey's philosophy from any metaphysic that either (a) declares that experience itself can never be experienced or (b) maintains that denotation is always subordinate, at any rate in principle, to connotation. The former of these points perhaps deserves more discussion than Mr. Dewey gives it. The latter, while it forces him to break with all metaphysical rationalists and with many conceptualists and logistical intellectualists, would

permit him to remain in very good company—say in Mr. Alexander's. Since Mr. Dewey's principles, however, are rather permissive than constraining, a mere general agreement is of little moment. The important question is *what* denotations experience, as he reads it, gives.

Mr. Dewey objects to classifications. Instead of asking experience to solve its own problems in the great adventure of historical process, many philosophers, he believes, have set themselves, in effect, to the task of defending the efficacy of this or the other label; and therefore have fallen by the wayside. What is worse, indeed, many of them have mistaken their cherished labels for efficient causes. For Mr. Dewey, on the contrary, causality itself is just the sequential order of nature. Its stuff is history; and functional interconnexion, the way in which events lead up to and blend with other events in nature, *is* the reality that is mocked by these idols of Class and of Cause. Here, I suppose, we should look for his 'pragmatism' or 'instrumentalism'; yet, finding them, we may find them with a difference from what opponents (and others) very commonly allege. "It is characteristic of the inevitable moral prepossession of philosophy," he says on page 151, "together with the subjective turn of modern thought, that many critics take an 'instrumental' theory of knowledge to signify that the value of knowing is instrumental to the knower. This is a matter which is as it may be in particular cases; but certainly in many cases the pursuit of science is sport, carried on, like other sports, for its own satisfaction. But 'instrumentalism' is a theory not about personal disposition and satisfaction in knowing, but about the proper objects of science, what is 'proper' being defined in terms of physics." Again "this theory, explicitly about thought as a condition of science, is actually a theory about nature" (p. 159)—and defines nature so far as such definition is possible. Finally, it is catholic. "Knowledge is a word of various meanings. Etymologically, 'science' may signify tested and authentic instance of knowledge. But knowledge has also a meaning more liberal and more humane. It signifies events understood, events so discriminately penetrated by thought that mind is literally at home in them. It means comprehension, or inclusive reasonable agreement. What is sometimes termed 'applied' science, may then be more truly science than what is conventionally called pure science. For it is directly concerned with not just instrumentalities, but instrumentalities at work in effecting modifications of existence in behalf of conclusions that are reflectively preferred. Thus conceived the characteristic subject-matter of knowledge consists of fulfilling objects, which as fulfilments are connected with a history to which they give character. Thus conceived, knowledge exists in engineering, medicine and the social arts more adequately than it does in mathematics, and physics" (p. 161). And ultimately theoretical criticism, which is philosophy, deals with the "discovery of the conditions and consequences, the existential relations, of goods which are accepted as

goods not because of theory but because they are such in experience" (pp. 432-433).

Thus we are assured, on the one hand, that this pragmatic instrumentalism, giving its due to pure and to applied science alike, cannot be opposed to either; and on the other hand, that it accepts, with piety and goodwill, the substance of everything that the loftiest humanistic idealism could possibly lay claim to. This assurance, for the first part, embraces the sciences and all reason-in-practice on the ground that thought itself is the hazard and enterprise of a nature full of problems and given to communings with regard to their issue. Things, *res*, histories, states of affairs are always affairs-at-issue; and they may become scientifically so. For the second part, we do appear to be forbidden anything superhuman or other-worldly. Modern divinity, however (I suppose), need not be perturbed at this for it seems to prefer (human) 'religious experience' to theology, and if (to some of us) there is something a trifle telluric and parochial in making an exclusively human experience so very important in Nature, Mr. Dewey, I suppose, has considered and rejected any lonely objections of this description.

In his explorations into these affairs-at-issue, Mr. Dewey is very busily employed with the distinction between means and end, meanings and termini or (in thought and language which suggest Sherrington's, although Sherrington's name is never mentioned), preparatory adjustment and consummatory fruition. The consequences for theory of knowledge are among the most important that arise from this prolific seed. In a provisional (but quite emphatic and unmistakable) sense, nature is full of endings; and human nature, more especially, is apt, time and again, to run upon those distinctive consummations of natural process which we call *sensa* and passions. Such (relative) endings-in-experience, however, are non-cognitive. They are *had* not *known* (even 'by acquaintance' which is a species of knowledge less aloof than knowledge-about but not distinct from knowledge). They are direct appropriations and satisfactions, not the tools of significant cognition. Legend and myth and the æsthetic (not the practical) side of art, are their appropriate bloom and fruit. Science, cognition, and (more generally) meaning is an affair of significance. To look towards consummatory cognition for an ideal of knowledge, as so many philosophers have done, is in truth to embrace a chimera. Things are known (or achieve comprehensibility) in so far as they *make* sense. "Events turn into objects, things with a meaning" (p. 166); and they achieve communication. "Where communication exists, things in acquiring meaning, thereby acquire representatives, surrogates, signs and implicates, which are infinitely more amenable to management, more permanent and more accommodating, than events in their first estate. By this fashion, qualitative immediacies cease to be dumbly rapturous, a possession that is obsessive and an incorporation that involves submergence: conditions found in sensations and passions. They become capable of survey, contemplation, and ideal or logical elaboration; when something can

be said of qualities they are purveyors of instruction" (see Chap. V., p. 167, and the rest of this brilliant exposition).

Meaning, however, is not idea; for mind is not consciousness. "Mind is contextual and persistent; consciousness is focal and transitive" (p. 303). "Consciousness, an idea, is that phase of a system of meanings which at a given time is undergoing re-direction, transitive transformation" (p. 308). These 'ideas,' however, do not imply any pre-established harmony, as if we had to believe *à priori* in "a knowing mind wholly guileless, and extraordinarily competent, whose sole business is to behold and register objects just as what they are" (p. 309). Possessing meanings (for we may possess these as well as what is meaningless and entirely consummatory) we are provoked or incited to thought and idea—to *taking* thought instead of accepting a mode of significance. To take thought is to search for consequences, at whatever level the problem incites to the search. "That a perception is *truly* cognitive means that its active use or treatment is followed by consequences which fit appropriately into the other consequences which follow independently of its being perceived" (p. 323). To be sure, a consciousness which rests in immediate awareness may occur in nature. Indeed, consciousness may originally have been a 'dream-like irresponsible efflorescence'. Ideas of this sort, however, are desultory, fantastic and impertinent when permitted to remain in their immediacy. On the whole "the immediately given is always the dubious; it is always a matter for subsequent events to determine, or assign character to" (p. 349) and it is part of the way and meaning in which the organism participates in the course of events.

These natural integrations of function and structure, flights and perchings, change and stability, contingency and routine, æsthetic essence and instrumental significance, it is alleged, taken concretely, denotatively, and in their own proper sinuosities and affinities, form, in their connexions, the self-interpretation of natural experience. This is the catholic and genuine perspective according to which our traditional problems, and especially our subjectivisms, romanticisms and dualisms, are permitted, quite naturally, to overcome themselves. What we have to do is to learn (adequately) the fundamental lesson that the 'how' of natural sequence is the sole legitimate canon of explanation. Classical philosophy pursued the phantom of a completely stable fruition of knowledge; modern philosophy thrust the *nous* of the ancients, first into the individual (with Descartes) and then (with Locke) into his passing mind. There seemed nowhere else to put it. The method here was ultimately classification. To everything its place. As a climax, we have the monstrous absurdity solemnly pressed home upon us that a *method* of production and direction (for this is meaning, knowledge, and reason too) is the *cause* of the history in which the method occurs. Essences do not produce; on the contrary they describe the process of production; and so universally. Romanticism with its 'vast and somnambule egotism' transforms the

partial privacies of individual experience into a demiurge dreaming to too much purpose. Berkeley's 'spirits' are but Protestantism taking itself as a matter of course; and the entire psycho-physical problem of the last three centuries is a spidery subtlety suspended from a mistake.

In reality, there is *no* problem of the relation between physical and psychic. While it is important to distinguish between psychical and physical functions, it is absurd to regard either of them as causes. The reality is growth-process itself. Organised life and mind is psychical at a certain level and that is all about it. Just as childhood and maturity are different stages of growth, important to distinguish but not reciprocally causal, so here. Psychical and physical no more interact or are parallel within me than my childhood interacts with or is parallel to my maturity. Instead, we have to consider body-minds as they occur; and although we have manufactured so many difficulties that we can scarcely aspire to keep straight in our thinking, we can understand in principle and begin, with wariness, to correct our simpler lapses. "In the hyphenated phrase body-mind, "body" designates the continued and conserved, the registered and cumulative operation of factors continuous with the rest of nature, inanimate as well as animate; while "mind" designates the characters and consequences which are differential, indicative of features which emerge when "body" is engaged in a wider, more complex and interdependent situation" (p. 285).

It is evident (and I think Mr. Dewey would admit) that, even if he is right, it is exceedingly hard (if not impossible) to correct our stubborn, if inadequate, ways of thinking, unless partially, progressively, and with a view to the more intelligent use of new and superior principles. Thus in the above account of the affair-at-issue which is body-mind there are obvious weaknesses. If we hold, as most of us do, and as Mr. Dewey certainly does, that mind has a structure, habits, and memories, we have simply no business to say that 'bodily' functions are essentially and peculiarly cumulative, registering and conserving. The 'wider' and 'more complex' situation of 'mind,' again, is open to argument. 'Mind' may be concerned with the relatively simple problem of eating cheaply at an A.B.C. shop or expensively at the Ritz. The wider, subtler and interdependent situation of dealing with the viands is body's affair; and when Mr. Dewey says that 'whenever the activities of the constituent parts of an organised pattern of activity are of such a nature as to conduce to the perpetuation of the patterned activity, there exists the basis of sensitivity,' he is saying what is not the fact. Plants and machines have this basis and do not appear to be sensitive. In short, these natural alliances, if they are not mysterious, are at any rate more singular than these facile generalisations suggest.

More generally, if we admit that classification may be over-weighted in our philosophies, and 'causes' vexatiously introduced

to our ultimate undoing, it is surely unnecessary to conclude that there are no classes and no causes. Similarly, if every 'where' and 'why' and 'therefore' is ultimately some sort of 'how,' we have at least to discriminate between classificatory, causal and other 'hows'; and it does not follow that these discriminations are negligible or completely subordinate to Mr. Dewey's sequential order. Childhood and maturity, for example, are historical stages and nothing more. Nevertheless, both may have causes; and the problem of psycho-physical interaction, in one of its aspects, is precisely whether mind and body *are* historical stages (and nothing more) or whether, in addition, there is causal influence between them. This (among other things) is a denotative difference within history (although not outside it) and it is not at all evident that the *one* category of sequential order (simply pointed out by experience) is capable of overriding or determining the causal and other distinctions found within it. And so in general. Setting aside the problem of the relation of 'experience' to 'nature,' there is surely *something* to ask on Mr. Dewey's own showing. We have to admit contingency and stability, he says, for we find them in experience (or in nature) and we can point to some of the principal ways in which, functionally, each supplements the other. This is valuable and important; but it cannot decide whether the 'contingency' which presents itself is ultimately irregular—mere caprice and roving on Nature's part—or whether its presented irregularity is really a determinate function of inevitable law. In particular cases this is evident. To the Jew (denotatively) the wind blew whither it listed. To our meteorologists (also denotatively) this contingency is at least qualified. What practical or experiential 'contingency' is free from considerations of this species? And if we find, on fuller experience, that what was supposed to be contingent *is* not (and never *was*) contingent, how precisely is our catholic adherence to the sequential order able and willing to help us?

These difficulties, and others like them, do not seem to me to be trivial; yet in conveying my sense of them I should like, if I could, to avoid a *suggestio falsi*. I cannot help doubting whether the experiential method, as Mr. Dewey describes it, is capable, in its principle, of dealing with more than a part of the task which all thinking, just because it is thinking and concerned with genuine problems, is logically bound to undertake. Even a partial solution, however (if, on its own showing, it must be partial), may be of the greatest consequence. Mr. Dewey, I am sure, would be the first to deny that he had done all that his method allows within the large (but still restricted) ambit of his enquiry, but I am inclined to think he has done more with his chosen theme and in his own fashion than any other living philosopher could have done, and I do not see how any reasonable person could withhold his most sincere admiration from a work which, in an eminent degree, is wise, fearless, sincere and comprehensive.

JOHN LAIRD.

Le Problème Logique de l'Induction. By JEAN NICOD. With a Preface by A. LALANDE. Paris: Félix Alcan: 1924. Pp. vi + 83. Price 10 francs.

THE death of Jean Nicod last year at the age of thirty removes one of the ablest of French logicians. After graduating at the Sorbonne, Nicod studied at Trinity College, Cambridge, under Mr. Bertrand Russell, and there published the paper by which he is best known—"A reduction in the number of the primitive propositions of logic" (*Proc. Camb. Phil. Soc.*, Vol. XIX.). In this, by using Dr. Sheffer's one indefinable relation of incompatibility, he shows that the five formal primitive propositions of *Principia Mathematica* may be replaced by one highly complicated proposition, thus completing what is called in the new edition of *Principia* "the most definite improvement resulting from work in mathematical logic during the past fourteen years." "Dans ce domaine [de logique et logistique], auquel se consacrent dans notre pays si peu de mathématiciens ou de philosophes," writes M. Lalande in an admirable biographical preface to this book, "il apportait les ressources d'un savoir et d'une ingéniosité qui promettaient un continuateur éminent à l'œuvre si malheureusement interrompue, en France, par la mort tragique de Louis Couturat—et que la sienne laisse de nouveau en suspens."

This slim volume is one of two theses submitted shortly before his death for a doctorate at Paris. [The second and larger one, *La Géométrie dans le Monde Sensible*, published uniformly with this, is quite as important and will doubtless receive detailed examination in MIND.] Here Nicod undertakes a critical examination of Mr. J. M. Keynes's treatment of induction in his *Treatise on Probability*. "Puisque nous devons plusieurs fois critiquer M. Keynes, disons ici qu'à notre sens, nul auteur depuis Mill n'a autant avancé la théorie logique de l'induction" (p. 11). This is perhaps a little hard on Jevons; but Mr. Keynes is right in saying that "amongst contemporary logicians there is an almost complete lack of constructive theory, and they content themselves for the most part with the easy task of criticising Mill, or with the more difficult one of following him" (*Treatise*, p. 265). Mr. Keynes, like Mill (to whom he bears many resemblances), has produced a constructive theory; and it is right and proper that it should be taken as the text of such a treatment as this (though a cynic might say that Nicod has chosen the easy task of criticising Mr. Keynes rather than the more difficult one of following him).

The main thesis of Nicod's book is that all induction rests ultimately upon *inductio per simplicem enumerationem*, and that to abandon this in favour of a "scientific induction" based upon analysis of the circumstances—"c'est lâcher la substance pour l'ombre". For the requisite conditions for "scientific induction"—what Mr. Keynes calls "argument by analogy"—are never fulfilled, and it is no good simply saying that this makes such inductions probable but not certain. "Mais en vérité, si les inductions

réelles ne remplissent pas les conditions qui les rendraient certaines et qu'on vient de se donner dans la théorie, il s'ensuit qu'elles ne sont pas certaines, mais nullement que malgré cela elles demeurent assez probables, ou très probables, ou extrêmement probables: la certitude étant manquée, la probabilité reste toute entière à établir, et la théorie toute entière à refaire" (p. 10). This *caveat* should be commended to the notice of all writers on the philosophy of science.

Before attempting the task of setting up in order to knock down a "scientific induction," Nicod, as is proper, makes a few remarks upon the theory of probability. For him probability is the relation of the Johnson-Keynes theory. "La perception de ce principe que la probabilité est une relation, non une qualité, des propositions enlève à la probabilité ce qu'elle paraissait avoir de fuyant et de provisoire. Elle la rend un fait aussi ferme que l'implication, par exemple. Les propositions qu'un ensemble donné de propositions rend probables à un degré p sont aussi bien déterminées que les propositions que ce même ensemble rend certaines, encore qu'elles soient parfois aussi difficiles à découvrir" (p. 20). After this enthusiastic confession of faith it is a little surprising to find Nicod qualifying the doctrine in two ways. In a footnote (p. 19) he thinks that a proposition may have an intrinsic probability "aussi directe et immédiate que la certitude": this might be called *plausibility* to distinguish it from the probability-relation, which alone is concerned in reasoning. And for a page Nicod discusses the difficult question as to whether an infinite probability (*e.g.*, that an unknown integer is not 1324) is equivalent to certainty and decides in the negative. But these are isolated points and have no effect upon his subsequent reasoning. On a third point, however, of the theory of probability Nicod seems to me to make a serious mistake which vitiates his arguments against "scientific induction". After describing the nature of probable inference from certain premisses he continues:—

"Mais toute inférence qui donne quelque chose à partir de prémisses supposées certaines donne encore quelque chose à partir de ces mêmes prémisses supposées seulement probables, et cela soit qu'il s'agisse d'une inférence en elle-même certaine, soit d'une inférence en elle-même probable. On peut même poser qu'à partir de prémisses qui ont, prises ensemble, la probabilité p , une inférence certaine confère à sa conclusion cette même probabilité p , et une inférence probable qui conférerait à la sienne la probabilité q si ses prémisses étaient certaines lui confère la probabilité pq " (p. 13).

This is true only if an important qualification be made. It follows immediately from the multiplication theorem for probabilities that $x/h = \frac{y/h \cdot x/yh}{y/xh}$. Putting $p = y/h = yh/h$ and $q = x/yh$, we see that x/h (the probability of x given h) is pq if and only if $y/xh = 1$, *i.e.*, if and only if y is known to be a necessary condition for x . So when Nicod goes on to say: "On peut donc dire que

l'inférence certaine transfère à sa conclusion la totalité de la certitude ou probabilité de ses prémisses prises ensemble, et que l'inférence probable lui en transfère une partie. . . . Observons que la conclusion d'une inférence n'en retire qu'une certitude ou probabilité au plus égale à celle de la conjonction de ses prémisses, par suite de l'une quelconque, et en particulier de la *plus incertaine* d'entre elles. Cette vérité fort évidente nous sera très utile" (p. 13) he is just making a bad blunder. "Cette vérité fort évidente" is simply not true in all except those uninteresting cases where the premisses are all known to be necessary to the conclusion. In the interesting cases where the premiss y supports the conclusion x but is not necessary to it, i.e., where $x/yh > x/h$ and $y/xh < 1$, it is simply false. The probability of the Einstein gravitation theory on general physical grounds supports the proposition that the photographs of the 1919 eclipse expeditions were not faked by German secret service agents, but the probability of the latter is much greater than the prior probability of its premiss, and may reasonably be used as a premiss in an argument to increase the probability of the Einstein theory. So Nicod is only developing his error when he differentiates between primary inductions not using inductive conclusions as premisses and secondary inductions which do so, and says of these latter: "La probabilité fournie par une induction quelconque ne peut donc surpasser la probabilité la plus haute que l'induction primaire est susceptible de livrer. C'est pourquoi l'induction primaire doit être analysée avant toute autre. Car elle n'est pas seulement le fondement logique de l'induction; elle marque encore la limite de toute assurance inductive" (p. 17). This is not the case: the problem for the inductive logician is not to find inductive hypotheses or primary inductions that are certain or even highly probable; the problem (which is hard enough) is to find principles capable of justifying induction that have *any a priori* probability. As Mr. Keynes shows very clearly in the exposition of his Inductive Hypotheses, "it is not circular to use the inductive method to strengthen the inductive hypothesis itself, relative to some more primitive and less far-reaching assumption" (*Treatise*, p. 260). So if we have some reason to believe a little in Nicod's primary inductions, the fact that secondary inductions based upon them are true will (under certain conditions) strengthen the primary induction. Nicod's fallacy in ignoring this vitiates a great deal of his criticism of Mr. Keynes.

Nicod discusses the main question of induction under two divisions—induction by infirmation and induction by confirmation. In the former we seek to establish a law by finding instances that contradict all alternative laws: this is the "scientific induction" to which logicians from Bacon to Mr. Keynes have been devoted, but which Nicod thinks is of little importance compared with the latter—Pure Induction. So the second and longest section of his book is devoted to a discussion of induction by infirmation.

"La forme essentielle et nécessaire de l'induction par infirmation" is, according to Nicod, "le transfert à l'une des lois d'un

groupe donné, par le rejet de tout ou partie des autres, de tout ou partie de la certitude ou probabilité de l'existence d'au moins une loi vraie dans le groupe" (p. 60). And this requires first the probability of determinism: "il faut poser qu'il est certain ou probable à un degré p que dans l'un quelconque des exemples du caractère A dont on se propose d'établir une loi de production, il y a, au sein d'une certaine classe a qui peut comprendre tous les caractères de l'exemple ou seulement certains d'entre eux, au moins un caractère qui entraîne A" (p. 60). But it requires much more than this. For even in the case where the instances are completely known so that the elimination is complete, we are up against the possibility of a plurality of causes, which it requires further principles to exclude. Nicod shows, I think quite correctly, that a principle directed against the complexity of a cause will give only a low probability to an induction of this type, but that one directed against the plurality of causes¹ together with the multiplication of non-identical instances can give a probability tending to certainty. But, of course, in no cases in nature are the instances completely known, and we hope by multiplying the instances to diminish what is common to them but not included in the law we are interested in, *i.e.*, to increase what Mr. Keynes calls "negative analogy". This, according to Mr. Keynes, is the function of the multiplication of instances in induction.² Nicod examines this operation with the aid of a "développement de la théorie du déterminisme" (p. 46), and he thinks that he can show that the probability cannot be made very large by this method even by the multiplication of examples to infinity. But in his attempt to do so he makes one bad mistake. He is considering the case of n instances of XA and the hypotheses that these n instances have no or one or two or . . . common antecedents of A beside X. "Mais ces différentes hypothèses peuvent être inégalement probables. Dans chacune d'elles, la probabilité de la loi X entraîne A est celle que lui donnerait l'hypothèse si elle était réalisée, multipliée par la probabilité de cette réalisation. La probabilité globale qui se trouve conférée à la loi est donc quelque valeur moyenne entre tous ces produits, inférieure au plus grand d'entre eux" (p. 51). This is not the case: a little probability arithmetic shows that the "probabilité globale" is the *sum* of these products and is greater than any of them. And so Nicod is wrong

¹ He suggests the following: "Sachant que le caractère A n'admet pas de condition nécessaire formée de l'alternative de moins de m conditions suffisantes, si l'on désigne par N la probabilité pour que A admette une condition nécessaire formée de l'alternative de moins de n conditions suffisantes, la valeur de N tend vers l'unité lorsque n augmente à l'infini" (pp. 35-36.)

² "The whole process of strengthening the argument in favour of the generalisation $g(\phi, f)$ by the accumulation of further experience appears to me to consist in making the argument approximate as nearly as possible to the conditions of a perfect analogy, by steadily reducing the comprehensiveness of those resemblances ϕ_1 between the instances which our generalisation disregards" (*Treatise*, p. 227, quoted by Nicod, pp. 45-46).

in concluding that "pour que cette probabilité tende vers la certitude lorsque n croît, il faut que l'un de ces produits en fasse autant" (p. 51); and consequently that if the possibility of elimination is the function of the multiplication of instances, the probability achieved is "bien éloignée de la certitude" (p. 54).

I am dealing with this section of Nicod's book rather summarily because the arguments (which, except for the definite mistake just mentioned, are good ones) seem all to depend upon the dogma that "la probabilité conférée par un raisonnement, quel qu'il soit, à sa conclusion est au plus égale à celle de la moins probable de ses prémisses" (p. 17), a dogma which I have already shown to be absurd.

The third section of the book deals with induction by confirmation, *i.e.*, Pure Induction. Here Nicod thinks that Mr. Keynes has made an important contribution in his theorems for the justification of pure induction, the more important in that his theorem that the verification in an instance x of a law g increases its probability, *i.e.*, $g/xh > g/h$, provided that $g/h > 0$ and $x/h < 1$, "achève donc de renverser la philosophie que nous avons précédemment critiquée, et à laquelle M. Keynes lui-même demeure encore attaché" (p. 67). For this theorem establishes of pure induction "qu'elle n'a pas le déterminisme pour prémisses, que sa force ne vient pas d'une probabilité d'élimination, et que la variété au moins probable des exemples ne lui est pas nécessaire" (p. 67). Let us examine these contentions.

With regard to the part played by determinism in this theorem there should be no real disagreement between Nicod and Mr. Keynes: "The common notion, that each successive verification of a doubtful principle strengthens it, is formally proved . . . without any appeal to conceptions of law or of causality" (*Treatise*, p. 236). Determinism, of course, comes in in the establishment of the *a priori* probability of any law by the Principle of Limited Variety (though Mr. Keynes does not make this as clear in his exposition as might be desired): but that is a different matter. Nicod, however, in accordance with his strange view, thinks that since the probability of the law is increased by verification, its prior probability cannot be a premiss in the argument. This is so obviously absurd that it is amazing that Nicod did not recognise it as a *reductio ad absurdum* of his dogma.

Nicod produces two proofs that the force of pure induction does not arise out of a probability of elimination and consequently that a new instance identical with a previous one can make a law more probable, both of which propositions are denied by Mr. Keynes. For "if the new instance were identical with one of the former instances, a knowledge of the latter would enable us to predict it" (*Treatise*, p. 236). But this, according to Nicod, would only be the case if it were certain that there was some law, whereas all that is required for the theorem is that it should be in some degree probable that there is some law, and that the law in question is the law. I think that if we limit our attention to the consideration

of this one theorem of Mr. Keynes's, Nicod is right. But I believe that it is impossible to find any prior probability for the law in question unless we assume not only that a thorough-going determinism is probable, but that it is certain; and that this is necessary to any reasonable theory (such as Mr. Keynes's) aiming at the justification of the proposition that any generalisation has some *a priori* probability. So the necessity for determinism comes in at a logically earlier stage; and $x/h = 1$ in the theorem if h includes a previous instance identical with x .

Nicod's second argument does not convince me at all. Even assuming determinism (*i.e.*, that $XL MN \dots$ implies A), a second instance of $XAL MN \dots$ increases the probability of the law "X implies A" because it increases the probability of "X implies $LMN \dots$." "Autrement, il serait certain que tous les exemples de XA sont identiques, et un seul de ces exemples suffirait à rendre X entraîne A certain: hypothèse qui rendrait tout nouvel exemple inutile" (p. 70). But surely all that would follow would be that $XAMN \dots$ implies L , that $XALM \dots$ implies N , etc.; all of which are inoffensive propositions included in the deterministic assumption.

Having decided that Mr. Keynes's theorem shows that the increasing of the probability of a law by Pure Induction does not derive its force from the possibility of eliminating irrelevant factors, Nicod goes on to consider the satisfaction of the conditions that this probability may tend to certainty as the number of instances tends to infinity. Mr. Keynes's conditions are (1) that the law has some initial probability: $g/h > \epsilon$; (2) that on the hypothesis of the falsity of the law, the probability that the law should be confirmed in n instances

$$x_1 x_2 \dots x_n / g^n$$

tends to 0 as n tends to infinity (*Treatise*, p. 236). And Mr. Keynes suggests that if all the properties in the universe are determined by a *finite* number of generator properties, these two conditions are satisfied.

(1) About this Nicod agrees with Mr. Keynes. "Il en résulte qu'un caractère X pris au hasard possède *a priori* une chance finie d'entraîner le caractère A pris également au hasard" (because there is a finite chance that they are both determined by the same set of generator properties) (p. 75). But he qualifies Mr. Keynes's statement of his Principle of Limited Variety in an important footnote: "A parler en toute rigueur, il faudrait . . . poser, non seulement que le nombre des groupes des caractères liés [*i.e.*, determined by the same generator property or conjunction of generator properties] est quelque nombre fini x , mais encore qu'il y a une probabilité finie pour que ce nombre x soit inférieur à un nombre donné—à un milliard, par exemple. Car si tous les nombres finis ont les mêmes chances d'être ce nombre x , il est infiniment plus probable que x est supérieur qu'inférieur à un nombre assigné

quelconque, en sorte que la conséquence qu'on vient de tirer de la finitude de x ne s'ensuivrait plus" (p. 75). This is an admirable exposition of a flaw in Mr. Keynes's Principle—a flaw which has been considerably discussed in Cambridge, but which I have not seen exposed in print before. Mr. Keynes has been guilty of a fallacy similar to that of the confusion of Convergence with Uniform Convergence in the theory of Infinite Series or of

$$(x) : (\exists y) \cdot \phi(x, y) \text{ with } (\exists y) : (x) \cdot \phi(x, y).$$

What is required to give an initial probability to any generalisation is not that the number of the groups is finite, but that it is less than some number given in advance. And when we remember that Mr. Keynes's Principle has to have some *a priori* probability, we see that this apparently slight change makes an enormous difference.

Indeed Nicod's apologetic "à parler en toute rigueur" somewhat diminishes the value of his footnote. It is one thing to believe that it is *a priori* slightly probable that the number of generator properties is finite (Nicod says this is "fort acceptable") : it is quite another thing to believe that it is *a priori* slightly probable that this number is less than a billion, for example. For this would seem to be one of the sort of things that cannot be supposed to be known *a priori*. Nicod's neglect to follow up his emendation is of a piece with the absence of any discussion of Mr. Keynes's Principle in itself.¹ I imagine that Nicod would have defended himself from this charge by saying that he was concerned with the "logical problem of induction" and not with its metaphysics. Lachelier is severely criticised in that in his *Du Fondement de l'Induction* "la grande affaire n'est pas de voir quels sont les principes de l'induction—cela [lui] paraît trop facile—mais bien de prouver ces principes. . . . Dans sa hâte de passer à ce travail de métaphysique, il n'aperçoit point que les principes dont il poursuit la preuve ne suffisent aucunement à justifier les inductions" (p. 55). But it is an easy and inadequate task merely to find a principle that will justify induction—Laplace's Rule of Succession will do so: the difficult and important task is to find a plausible principle, and discussion of the plausibility of such a principle cannot be ignored.

(2) However, Nicod's refusal to be drawn into a "travail de métaphysique" has enabled him (unlike most of Mr. Keynes's critics) to save some of his ammunition for the requirements of condition (2). Mr. Keynes does not use this in the form stated above, but converts it into a product of probabilities:—

$$x_1 x_2 \dots x_n / \bar{y} h = x_1 / \bar{y} h \cdot x_2 / x_1 \bar{y} h \dots x_n / x_{n-1} \dots x_1 \bar{y} h,$$

and says that the left-hand side tends to zero as n tends to infinity if each of the terms of the infinite product² is less than $1 - \epsilon$, where

¹ Indeed he does not state it in terms of generator properties at all: this perhaps accounts for his neglect to notice that a thorough-going determinism is involved.

² Or, of course, each of the terms after a certain point.

ϵ is some given number, however small. Nicod, though he casually mentions that this condition is sufficient but not necessary for the convergence to zero of

$$x_1 x_2 \dots x_n / \bar{g}^h,$$

discusses it in Mr. Keynes's converted form, *i.e.*, that on the assumption of the falsity of the law, there is always a probability greater than ϵ that the next instance will disobey the law. Mr. Keynes seems to have thought that this followed so obviously from his Principle of Limited Variety as to require no serious exposition: his "raisonnement . . . sous une forme assez condensée" (p. 76) consists of only one line (*Treatise*, p. 254). Nicod gives the deduction as follows: (a) If the law is false, it must be false in at least one instance. (b) But the number of non-identical instances is some finite number N , and (c) there is no reason to suppose that any one of these will be the next instance rather than any other. (d) So the probability that the next instance will contradict the law is greater than $\frac{1}{N}$. It is proposition (c) in this argument that Nicod

very rightly disputes. For it assumes that the number of numerically distinct instances arising out of each group of generator properties is equal, and that the fact that we continue not meeting (we) one of these instances does not diminish the probability that (we) shall meet it in the next example, an assumption which I agree with Nicod in thinking "véritablement inacceptable" (p. 77). [Here, by the way, Nicod is venturing into metaphysics.] But I see a possible method of escape for Mr. Keynes in the fact, casually mentioned by Nicod, that the condition discussed is more than is required. The necessary and sufficient condition that an infinite product $(1 - a_1)(1 - a_2) \dots (1 - a_n) \dots$ ¹ should tend to zero is that the infinite series $a_1 + a_2 + \dots + a_n + \dots$ should diverge.

And this can take place even if a_n tends to zero: the series $\sum \frac{1}{n}$ is divergent, for example. So the condition is satisfied if the probability that the next instance will not satisfy the law (on the hypothesis of the falsity of the law and its satisfaction in the previous $n - 1$ instances) does not tend to zero more rapidly than $\frac{1}{n}$, which is not unpalatable. But it is no part of my task in criticising Nicod to embark on the more difficult one of improving on Mr. Keynes.

Nicod concludes his brochure with a statement of the "état actuel du problème". "Il nous semble avoir montré que si l'élimination est le seul ressort de l'induction, comme les auteurs et le bon sens lui-même inclinent à le croire, aucune induction en faveur d'une loi ne peut dépasser une probabilité médiocre. Il nous semble également avoir montré que l'élimination n'est pas le seul ressort de telles inductions, et que les exemples d'une loi ont une force corroborante qui n'en est pas tirée et qui ne suppose point le déterminisme. Il nous semble, enfin, avoir montré que l'on n'a pas

¹ All the a 's being positive numbers less than 1.

su prouver encore que ces exemples, en se multipliant à l'infini, peuvent élever la probabilité de la loi au-dessus de toute limite. Tel nous paraît être l'état actuel du problème logique de l'induction" (pp. 78-79). I think that Nicod, misled by his dogma about the probability of a conclusion being always less than that of a premiss, has not proved the first of these contentions. As to the second, Nicod has pointed out many places where multiplication of instances in itself seems to be of importance: about some of these places he seems to me to be mistaken. With regard to the place of determinism and the question as to whether inductive probabilities can ever tend to certainty, I think that his discussion of the logical problems is incomplete without a metaphysical discussion which he denies himself. Nevertheless Nicod has boldly faced most of the important questions at issue: this little book, written without that verbosity which is so characteristic of treatments of induction, is certainly the most important work on the subject since Mr. Keynes's *Treatise on Probability*.

R. B. BRAITHWAITE.

The Growth of the Mind. BY PROF. K. KOFFKA. Trans. by R. M. OGDEN. Kegan Paul, Trench, Trubner & Co. 15s.

PROFESSOR KOFFKA'S book was written for school-teachers, and it is unfortunate that it should be so. There is, of necessity, a great deal of simple familiar material side by side with an unelaborate exposition of a new and interesting advance in psychological theory. Since, apart from a word or two in Köhler's "Mentality of Apes" and a few scattered articles, it is the only work embodying the principles of the 'Gestalt' school in this language, it is a pity that it does not go into greater detail in its exposition, though, as it is, its importance can hardly be exaggerated.

The principle feature of the Gestalt teaching is that mental life and the behaviour of organisms display organic unities. The static unity of equilibrium which is the resultant of several forces having certain relations to one another, and the dynamic unity of process which a swinging pendulum goes through in order to attain rest, are paralleled in perception on the one hand, and in instinct, reflex action and learning on the other.

An impasse had been reached. The ordinary mechanical account of pathway connexions between the periphery, the central nervous system, and the motor nerves, along which impulses ran like electric currents, had been found wanting when an attempt was made to give an explanation of instinct and learning, and many people threw up the scientific sponge and took refuge in psycho-vitalism. The Gestalt school provide an alternative to the mechanistic explanation, though it must be pointed out that the word 'mechanistic' is used here to denote a particular mechanism; the new school provides a different one.

In the case of reflex activity a complexity is involved on the old

basis for which there is no physiological evidence whatever. In the fixation reflex, for example, one must postulate a motor-sensory connexion, not merely for each point on the retina, but also for each point for each position of the eye, because the movements involved in fixating from A to B will be different according to the position of the eye fixating A when the retinal point B is stimulated. This consideration leads Koffka to suppose a closer connexion between the sensorium and the motorium, both forming one "self-regulating system" with a tendency to attain certain equilibrated states, so that a modification in one part of the system affects the other parts of the same organic unity.

A similar line of attack is adopted against the American account of instincts as chained reflexes. Thorndike gets over the difficulty of "persistence with varied effort" by introducing his satisfiers and annoyers, but to combine these with the connexions between nerve paths on which he insists lands us with a bewildering mass of mechanical connexions between possible annoyance situations, set up by the unsuccessfulness of reactions, and nerve fibres the innervation of which forms the succeeding attempt. There is too much complication even in the elaborate series of connexions which must exist to account for the accurate adaptation of reaction to stimulus in the case, for example, of birds and the varied sized sticks they must carry for their nest-building.

Thorndike's satisfiers are a useful bridge from his theory to the Gestalt theory. Koffka introduces the notion of "closure". In certain physical situations there is evidence of a 'seeking after' an end situation, and before the end-state is reached we have an *unclosed* situation, and when the end-state is established we have *closure*. It is suggested that the active aspect of instinctive behaviour—its striving towards an end-state—is an indication of a series of happenings which have an inner dynamic unity and direction, like the notes of a tune, or the oscillations of a pair of scales seeking to establish an equilibrium. The sensorium and the motorium are again conceived of as forming one system. There is no attempt to give a detailed physiological account—such attempts have been made by Wertheimer and Köhler—Koffka contents himself with throwing over the connexion hypothesis and an indication is given as to the direction which future research will have to take.

Side by side with these dynamic patterns of behaviour we have organic unities in perception. This is the field in which most of the detailed work of the school has been done. It is not treated fully in this book. Koffka confines himself to the problem of the phenomenal experiences of the infant. Observation of infantile behaviour would lead one to infer that if they have any perceptual experiences they must be simple rather than a blooming buzzing confusion. When the child reacts to a moving light it is taken to be an indication that a relevant change has occurred in its phenomenal experience, and if it has been quiescent up till then one must suppose that its experience has been undifferentiated and

indifferent. When, therefore, a light appears, "from an unlimited and ill-defined background there arises a limited and somewhat definite phenomenon, a quality". Koffka holds that the background, if entirely undifferentiated, *i.e.* *pure* background, does not exist phenomenally and that therefore the first experience of a child is a figure on a background, and here we have the kernel of the static pattern and the next important contribution of the Gestalt school to Psychology. The figure and the background are mutually interdependent in quality. The figure is what it is because it is on that particular background, and the background is what it is because it supports, as it were, that particular figure. Here again we have the organic unity; what Professor Ogden has translated as the "configuration". We have no such things as separate sensations which have no connexion with one another except being lumped together in a mere sum; we have a unity in which each part affects and supports each other part. Whether there can ever be pure background is unimportant, whether simple patches of colour on ill-defined background come before more complicated figures, such as 'friendly face' is also unimportant; the vital point is that what does occur is a unity and not a mere sum.

The problem of learning involves both these concepts. There is an unclosed situation, and in the closing of it new configurations are produced, both in perception and in behaviour. Koffka gives a long account of Köhler's apes. They sat and looked round them, grasped the problem, 'saw' the solution, and then carried it out. What did they see when faced with food, unattainable except with a stick, and the usual external objects in their cage, including a stick? The answer is that the stick and food are perceived, in the literal sense of the word, as having something to do with one another; a new configuration occurs, just like 'seeing' the way to do a physical task—the relevant parts stand out in some way. Now Bühler's account is that there is nothing new in the situation when the ape 'sees' that the stick has something to do with the solution of the problem, the perceptual configuration was there all the time, only 'unnoticed'. This brings us to one of the cardinal tenets of the Gestalt theory. There are no unnoticed configurations; if it was not noticed it was not there. The animal is in an unclosed situation—just unattainable supply of food which is wanted—and a new configuration—stick to pull food in with—arises as a bridge leading to closure. Why that particular configuration arises rather than any other we cannot say, but then why the important relations should suddenly be 'noticed' is just as obscure. We not only, then, perceive in terms of our actions but we perceive in terms of the possible utility of objects with respect to filling a gap in the situation, before ever they have actually functioned in this way; the apes used their rugs and bits of grass when no stick was handy. Of course this does not mean that if the animal had never seen a stick before he would use it or

see it as he does; but the way in which he does perceive it is nevertheless new, even if in some way determined by past events.

The principle of functional configurations lies behind instinct, training and intelligence alike. The difference between them lies in the stamping in or bringing out of the pattern in question. Some patterns are there from the beginning, some are achieved by chance and practice until they start out like the solution to a puzzle picture and the curve of learning falls abruptly, while in the case of intelligence something is 'seen' straight away like the general configuration of a tune, though it may take further looking or even practising performances to bring out the related intricacies of the accompaniment.

And then there are other directions in which this principle of organic unities can be applied. Recall by contiguous association works only within configurations, one member of a configuration tending to call up another; recall by similarity is reduced to recall by configurational or pattern resemblance; "Configurations once present will furnish conditions favourable to the appearance of others like or similar to them"—this is recognition by similarity.

But Koffka goes further and attacks the problem of our knowledge of what goes on in other people. He suggests that "every form of behaviour has a certain articulation and phrasing," which "issues from a similar articulation of the central nervous process of the acting individual" which "in turn corresponds to the individual's 'experience' which is articulated in a like manner". The articulation of the overt behaviour is, as it were, impressed on the visual system of the observer, which sets up a series of patterns ending in the onlooker having the same sort of feeling as the person he is looking at. This would account for the immediacy of sympathetic reaction, and for the reflection of the mother's smile in the child who is too young to refer back to past experience to interpret the phenomenon. Of course further complication enters when we *believe* the other person to be happy, as contrasted with a situation in which we make no judgment of the other person's state of mind but respond suitably to the 'mere impression'. Without some such notion of reflection it is exceedingly difficult to see how sympathy, which obviously is one of the roots of ethics, was ever developed.

Similar is the account of imitation. A specific instinct is denied, and Koffka relies on this intimate connection between the pattern in perception and the pattern in activity. The 'movement melody' is transposed from the model, through perception, to the muscles of the imitator. There is, however, a detail which is obscure in this formulation. The child is said to practise the imitation until it resembles the perceived model. Its persistence is put down to a realisation that in the response there is something lacking—it is "less good" and has the character of incompleteness: consequently on the principle of closures, further efforts are made until "the configuration of the model and its imitation attain a state of

equilibrium". But if there is this important similarity of pattern in the perceptual process and in the muscular response, surely this must be projected again into the perception of the response, so that all you get is a progressively developing perceptual configuration, correlated with a progressively developing muscular configuration. Where does the comparison come in, and how is the feeling of incompleteness aroused? On Koffka's plan, if the muscular response is correlated in form with the perceptual response, an imperfect imitation must indicate an imperfect seeing.

The details of the whole configuration theory are complicated, and only partially worked out. In perception it is quite clear that not all configurations have the same degree of hanging-togetherness. A change in the mother's expression will modify the figure in all its parts, but this vital change in the figure need not alter the figure-background configuration at all. A detailed examination of the mutual relations of configurations, and an investigation into the laws of closure and organic equilibrium are the next steps which must be taken. As a heuristic principle the Gestalt theory is one of the most important contributions which have been made to Psychology. It provides us with a constructive hypothesis, and gives us something to do besides cataloguing.

W. J. H. SPROTT.

A Grammar of Politics. By HAROLD J. LASKI, sometime Exhibitioner of New College, Oxford; Reader in Political Science in the University of London. London: George Allen & Unwin, 1925. Pp. 672. 18s. net.

THOSE who are acquainted with previous writings on political subjects by Mr. Laski will expect much from his new book; and they will not be disappointed. Perhaps the title of it may prove a little misleading. Some may think that a Grammar should be concerned either with the discussion of fundamental principles or with an account of the way in which they are illustrated in the structure of existing societies. Mr. Laski seems to understand Grammar as being essentially an art; and his book is largely occupied with the exposition of a definite political programme. For the majority of readers this may be a more interesting subject than a purely theoretical one would have been; but it is more difficult to deal with satisfactorily in a philosophical Journal. The book is, however, by no means lacking in theoretical interest; and it is mainly from this point of view that it must be regarded here.

The general basis of Mr. Laski's treatment is not quite easy to characterise. His references to writers on political theory are surprisingly slight. The most definite is to Bentham. He says (p. 24) that his own doctrine 'is a special adaptation of the Benthamite theory to the special needs of our time. It follows Bentham in its insistence that social good is the product of co-ordinated intelligence; that, though the difficulties be admittedly

great, we must plan our way to the end in view. It follows Bentham, also, though from a different basis, in urging that social good means the avoidance of misery and the attainment of happiness. It applies reason, that is, to the task of discovering ways in which wants can be satisfied; and it evaluates the quality of wants according to the degree in which, when satisfied, they minister to the permanent happiness of the whole community. Where it differs from the Utilitarian outlook is in its rejection of the egoistic nature of impulse and the elaborate calculus of pains and pleasures. . . . Our view is rather, first, that individual good cannot, over a long period, be usefully abstracted from the good of other men and, second, that the value of reason is to be found in the degree to which it makes possible the future, not less than the immediate, harmony of impulses. . . . Social good is thus such an ordering of our personality that we are driven to search for things it is worth while to obtain that, thereby, we may enrich the great fellowship we serve.' This is somewhat vague; and, as we proceed with the reading of the book, it becomes apparent that some conceptions are made prominent that have little, if any, connection with the teaching of Bentham. Perhaps they are somewhat akin to the view of Prof. Hobhouse. But the idea of co-operative creation is much emphasised throughout; and this appears to bring Mr. Laski's work into close relation to the brilliant writings of Miss M. P. Follett; yet, though he refers to her twice (once to her *Creative Experience*), neither of his references is to *The New State*, in which the general doctrine of co-operative creation is most definitely explained and illustrated; and it can hardly be said that he himself supplies any clear and complete explanation and defence of that doctrine. However, if it is not fully explained, it is at least vigorously applied. It may be regarded as a substitute for Rousseau's conception of a 'General Will,' which he rejects (p. 68).

Apart from this conception of co-operative creation, perhaps the most distinctive feature in Mr. Laski's theory lies in the definite province that he assigns to the State. This term is apt to be used in very different senses by different writers. Some—as in the famous phrase that is ascribed to Louis XIV—understand it as meaning the supreme Government. Others tend to identify it, more or less completely, with the whole community. Mr. Laski seeks to avoid both these extremes; but his statements are not quite as definite as one might wish. The following is the clearest that I can find. 'There is a difference,' he says (pp. 26-27), 'between the State and society. The State may set the key-note of the social order, but it is not identical with it. . . . Granted that, in any ultimate analysis, the real rulers are undiscoverable, the legal source of daily power is resident in those who legislate. . . . In practical life, therefore, the effective source of State-action is the small number of men whose decisions are legally binding upon the community. . . . They are at once the trustees and governors of the whole. . . . Our ultimate allegiance is always to the ideal; and

to the legal power that seeks to bind us our loyalty is conditioned by the purpose and substance we can discover in its effort.' Thus I understand his view to be that the State is the community regarded as a single whole in which laws are made and enforced, the validity of which is always subject to the consent of the individual citizens. It is at this point that it is important to understand Mr. Laski's conception of sovereignty.

His view about this has been to a large extent made plain in some of his previous writings, especially *The Foundations of Sovereignty*. His contention, which is here reinforced, is that it is not possible to point to any one element in the life of a community in which it can properly be held that sovereignty resides. He urges (p. 271) that the citizen's 'ultimate allegiance is not to some collective entity outside himself, but to the ideals his experience has taught him in his conscience to accept. It makes decision his business and his choice.' This seems to imply that the only ultimate sovereign is a man's own conscience, guided by the spiritual traditions of the race. This, however, does not involve anarchy. The community is essentially co-operative: it forms institutions through which welfare is creatively achieved. In general, loyalty to these is the citizen's duty; but he must have perfect liberty to criticise, and, if necessary, to rebel. It is in connection with this right that Mr. Laski is led to emphasise his well-known view about the importance of a complete separation between Church and State. A State Church is his *bête noire*. 'Religious toleration,' he urges (p. 119), 'cannot be fully attained so long as a State maintains special relations with a given Church.' It seems to me that this contention is somewhat unduly emphasised by Mr. Laski; though, of course, his plea for toleration must be cordially approved. The special prestige that attaches to the State Church in England, against which he so strongly protests, is due to obvious historical circumstances, and cannot properly be used as a ground for attacking all national institutions of a religious character. Mr. Laski does not appear to have any similar objection to national schools; and in that case it is pretty obvious that no special prestige is attached. Might it not be maintained that it is the duty of the State to provide some form of civic education for adults, and would not this have at least a quasi-religious character? It might even be urged that Mr. Laski's conception of man's chief end as lying in the achievement of what he calls 'happiness in a creative sense' (p. 98) is essentially a religious conception; and perhaps a hostile critic might suggest that what Mr. Laski really contends for is that there should be no State religion except his own. I do not urge this; but I do not find it altogether easy to understand, apart from the question of special prestige, on what grounds it is to be held that religion should be regarded as lying entirely outside of the province of the State. Is it really possible to make a sharp division between the things of Cæsar and the things of God?

The complete exclusion of religion tends to concentrate attention

on the purely legal and economic aspects of the nation's life; and on the latter, in particular, Mr. Laski supplies a great deal of interesting material. He says roundly (p. 587) that 'politics includes economics'. He is not a communist, and it is only in a rather wide sense that he can be described as a socialist. He appears to have a good deal of sympathy with the Guild socialists, but criticises several of their proposals (pp. 544 *sqq.*). He emphasises, like Veblen, Tawney and others, the evils that are generated in an 'acquisitive society'; but he defends private property when it is definitely associated with service. Perhaps he treats it a little too much as a *reward* of service, rather than as an *instrument* of service; but he urges that, on either of these grounds, it is not easy, in general, to justify its *inheritance* (pp. 527 *sqq.*). This can only be approved when there are specific grounds for the assignment of property to some particular persons, such as a wife or children or others who are competent to use it for the common good. His suggestions about this are interesting; and his proposals seem, on the whole, equitable. The chief doubt would be on practical grounds, especially as to whether any authority could decide on the propriety of particular bequests in a way that would be recognised as just. But this is a problem for the practical statesman. In general, it is not apparent that there is any essential difference between the relations of the State to economic problems and its relations to those that are more purely spiritual or cultural. In both cases it is comparatively easy to see what are the desirable ends, but very difficult to see how they are to be secured without complex regulations that would generate a regrettable amount of friction and interference with individual freedom. In both cases it would seem that some degree of compromise must be allowed in practice.

The problem of international relations is dealt with by Mr. Laski in a particularly comprehensive and thorough fashion. He has evidently made a careful study of the working of the League of Nations, and has far-reaching hopes for its future development. He speaks confidently (p. 227) about 'the disappearance of the sovereign nation-State,' and believes that it is quite 'possible to administer and to legislate internationally'. He thinks that the League may already almost be described as containing the beginnings of a super-State (p. 588); though it has to be admitted that it is not as yet 'a super-State in any administrative sense of the word' (p. 625). In connection with this he emphasises the need of 'a liberal education in that cosmopolitan outlook which the needs of humanity have made so essential' (p. 642). He thinks that this is gained in the working of the League. But would it not be well to supplement it in other ways? If so, this seems to supply an additional reason for doubting whether States can afford to stand altogether aloof from the spiritual and cultural aspects of life.

The book as a whole is undoubtedly very able, interesting, forcible and clearly written. There are a considerable number of

small misprints in it; but they can be easily detected. I have found the Index somewhat inadequate.

J. S. MACKENZIE.

The Ethics of India. By E. WASHBURN HOPKINS. London: Humphrey Milford, 1924. Pp. 265.

In Europe and America, as Dr. Hopkins himself remarks, the ethics of India are almost a *terra incognita*. The little that has been written in relation with it has been mostly by not very scrupulous and not very scholarly missionaries and has suffered both from misunderstanding and from misrepresentation. The subject is much more vast and more complicated than the present volume suggests, but it is gratifying to be able to recommend it as a historical introduction, with confidence in view of its fidelity to the sources.

The scope of the work is definitely limited. Although he makes incidental references to the more metaphysical principles of Indian philosophy, which are themselves becoming better known in the West, Dr. Hopkins is not concerned so much with the ethical implications of the different systems as with bringing together the details of the moral judgments and ideals which have found expression generally or in particular movements in India. He is in large measure correct in saying that the ethical is there taken for granted, and that there is no systematic study of ethics. But it is only right to remember that in none of the subjects of mental and moral science are there systematic works in the modern Western sense. Only within recent times, under the influence of the West, are such works beginning to appear. So far, there has certainly been found less of distinctly ethical literature than of the other types. Nothing has been found which might be compared, for example, with Aristotle's *Nicomachean Ethics*. Nevertheless, there is more systematic thought than Dr. Hopkins gives credit for or evidence of. Though somewhat scattered in regard to its literary sources, it is embedded in the mind and life of the educated Indian, and to a considerable degree permeates the common life. It should also be noted, though Dr. Hopkins does not mention it, that there is a term in use to cover what is implied by a science of ethics: *niti-shastra*. The term *dharma-shastra* is sometimes used with similar connotation, though also in other ways. There is little literature extant under the title of *niti-shastra*, but that may be because the ethical is so important in the great epic, the *Mahābhārata*, especially in the twelfth book, that other similar literature has been absorbed in it, or altogether rendered unnecessary. In its proper historical position, Dr. Hopkins makes some references to the epic, but they are altogether inadequate in view of its importance. Dr. Hopkins is himself a leading authority on the epic, and it is strange that he does not stress its character as a

great moral drama, and see the significance of Dr. Dahlmann's contention (*Das Mahābhārat*, Berlin, 1895), that the epic is a "dharma-shastra, a book of sacred law, of duties and customs". That is a view confirmed by Mr. Vaidya (*The Mahābhārata*, Bombay, 1905), who says, "In fact the work has almost lost its character as an epic poem, and has become, and has always been acknowledged, as a *smṛiti* and a *dharma-shastra*."

The earliest sources are the liturgical hymns of the *Rig-Veda*. Dr. Hopkins might have indicated a systematic tendency in a threefold use of the term, *rita*, there found, as (i) the regularity or order of non-human physical processes; (ii) order in moral conduct; and (iii) order in the relations of gods and men as expressed in the ritual or sacrifices of religion. More particularly ethical is the distinction of *ṛiṇu* and *vṛijina*, the straight and the crooked, "the exact linguistic equivalents of the English words, right and wrong". The moral path is the "law of the gods": it is also the way of the *pitri*, the fore-fathers: it has a divine sanction, and the sanction of tradition. Peace and security are ensured by these laws: their violation is a form of arrogance. The *Rig-Veda* shows the moral as associated with a sense of kinship between men and gods. We suggest that in the popular mind this was continuous right up to the later times of devotional theism when Dr. Hopkins again refers to a similar attitude. The next sources reflect a confusion between morality and ritual purification of a magical kind. Nevertheless they show some advance in making the purification, whether moral or ritual, depend more upon personal effort and less on the good will of the gods. A definite tendency to centralisation is evident in the recognition of the "Lord of Creation" as a great moral controller of the world, as contrasted with a multiplicity of spheres of influence of different deities. The pantheistic and acosmist philosophies which begin to appear now, and are more elaborated in the *Upanishads* of the following period, are in no ways meant to be antagonistic to the ethical. Of course, logically thought out, they may be so, as many later Indians and most Christian missionaries have interpreted them, but it is abundantly clear that there was no such intention in the minds of the composers, and no such acknowledgment by the leading Indian thinkers in the course of later history. All insisted on the moral at least as much as, and with no worse logic than, the late Dr. Bradley and Professor Bosanquet. There is an insistence on the unity of the mind as knowing with its other characteristics, a unity sometimes not sufficiently acknowledged in Western thought. "He who has not ceased from immoral conduct cannot obtain god through the intelligence": "only when the whole nature is purified are the bonds released which keep the soul from god". Dr. Hopkins ought to have made it clearer that here knowledge has something of a mystical character, such as seems implied, for example, in the somewhat analogous New Testament statement that the pure in heart shall see God.

Definite Hedonisms are rare exceptions in the ethics of India: the author mentions only incidentally the Charvakas, and the erotic tendencies of movements which he rightly designates aberrations. There is, in general, a marked differentiation between the good and the pleasant: "The good and the pleasant approach a man and the wise man discriminates between them, choosing the better not the more pleasant; the fool, through greed and avarice, chooses the more pleasant, but well for him who chooses the better; whoso forsakes the better and chooses the more pleasant fails of his aim." There are nevertheless hedonistic traits, and it is evident that happiness is recognised as a feature of the ethical ideal. In the later Vedic and early post-Vedic thought, man desires immortality as life with the gods, for "the gods are bliss," and "the soul of a god is always joyful". In the theistic schools this impression still clearly predominates. And Dr. Hopkins makes the interesting suggestion that at least partly from this comes the notion of *ananda* or bliss which is one of the three qualifications (*sat, chit, ananda*) by which the Absolute is described in the monistic systems. Although the Absolute, identity with which is often represented as the ideal, is described as without passions and without parts, that ideal is not, as Western thinkers have often supposed, without happiness, for bliss is of the very essence of the Absolute.

The implication of the doctrine of *Karma* is also that happiness goes with virtue, and misery with vice. There has been a great deal of misunderstanding of the doctrine of *Karma* among Western writers. It is true that the idea is variously conceived in Indian thought, and not infrequently conflicts with other theories held. Dr. Hopkins seems to us to state accurately the essence of the doctrine viewed ethically. "The ethical value of the *Karma* doctrine in popular as well as in philosophical religion is very great. It teaches that there is no such thing as a cruel Fate or an unjust God; that it is foolish to rail at misfortune as if it were undeserved, or to expect a better fate hereafter if one is not morally prepared for it. *Karma* takes, as it were, the place of a just, logical, irresistible divine Power. It rewards virtue and it punishes vice (mentally and bodily) with the unerring fruit of the deed. All its rewards are for the good; all its punishments are for the wicked. It represents a cosmic power of righteousness forever working through encouragement of virtue toward a high ethical goal." Quite contrary to the frequent contention, it implies a freedom of action in the present and not an unmitigated determinism. It is an individual's suffering or enjoyment in the present which is determined by his past acts, and not his present acts which are so determined, a view which would make all teaching as to moral effort and redemption simply ridiculous.

It is to be regretted that Dr. Hopkins gives only the barest references to the psychology of the moral life, a subject of outstanding importance and very frequent discussion in Indian

literature. Indian thinkers, as at the same time practical teachers, were occupied largely in studying the springs of human conduct and the methods by which desires could be rationalised or transcended. The most valuable feature of Dr. Hopkins' treatise is his account of the virtues approved and the vices condemned in the various movements, indicating the broad similarities and the individual differences which have special significance for a correct appreciation of the development of Indian ethical thought. He notes that they are related especially with village life, and that the conditions are essentially aristocratic. Throughout the greater part of the history there is a two-fold standard, one for the ascetic, the other for the ordinary layman. In Buddhism, the former, obviously more strict, is predominant. The virtues are mainly passive and quietist, and they are somewhat egoistic in inspiration even when socially beneficent. The five great virtues are truthfulness, self-restraint, compassion and hospitality, uprightness, and non-destruction of life. In this last, *ahimsa*, Dr. Hopkins sees "something better than we know" in the West. Yet, admitted that *ahimsa* is widely interpreted as absence of cruelty, indeed as the presence of kindness, and this to all living beings, it can hardly be said to include that positive benevolence which may involve self-sacrifice. Even Dr. Hopkins himself maintains that later Mahāyāna Buddhism marks a distinct ethical advance over earlier Buddhism and over Hinduism, just in its change from mere self-training to self-sacrificing love.

Valuable as it is, Dr. Hopkins' work does not bring into relief the main principles and methods of the Indian treatment of the ethical. Some are not mentioned; others are lost sight of in the course of the exposition. It is worth while briefly enumerating the chief of these, and in doing so it is better to introduce a little more system than is immediately apparent in the sources than not to do justice to the systematic tendency genuinely present in Indian ethics. First there is the doctrine of the *Gunās*, according to which conduct may be classed as (i) *tamasik*, confused, inco-ordinated, not governed by any centralising principle; (ii) *rajasik*, centralised and co-ordinated but directed solely to individualistic ends, so essentially selfish; (iii) *satvik*, centralised, co-ordinated, but also universal in aim. Secondly there is the conception of *Purushartha*, the great objects of human life, those of pursuit, *Pravṛtti*, and those of renunciation, *Nivṛtti*. The former include *Dharma*, religion and moral virtue; *Artha*, economic and social welfare; and *Kāma*, enjoyment, as love and the æsthetic sides of human culture. Thirdly moral conduct is to be viewed socially under the idea of *Varnashrama*, castes or social groups and their duties: (i) *brahmin*, leaders in religion, learning, and political counsel; (ii) *kshattriya*, rulers and guardians of public order; (iii) *vaishya*, merchants and traders, organisers of public wealth; and (iv) *sudra*, the class of manual workers. Finally, morality may be considered in relation with the *Ashrama* or periods of the individual

life: (i) as *brahmacharya*, or student; (ii) *grihasta*, householder and citizen; (iii) *vānaprastha*, the first stage of renunciation, as forest-dweller; (iv) *sannyasi*, the second stage of renunciation, as devoted solely to the spiritual.

Notwithstanding its limitations, some of which are indicated above, Dr. Hopkins' book gives us a much-needed survey and may be regarded as at present the most reliable historical introduction to its subject.

A. G. WIDGERY.

VII.—NEW BOOKS.

La Déduction Relativiste. BY ÉMILE MEYERSON. Payot. Pp. xvi, 396.

M. MEYERSON is already well known in England as the author of two books on the fundamental principles of scientific thought, *viz: Identité et Réalité* and *De l'Explication dans les Sciences*. He has a profound knowledge of the history of science, and he combines this with very wide reading in general philosophy and theology. His method is to consider the historical development of scientific thought; to compare and contrast this with contemporary systems of metaphysics; and to disengage what is permanent and essential to scientific procedure as such from what is temporary and adventitious. In the present book he takes the General Theory of Relativity as the subject to which he applies this method. The result is an extremely interesting work, which is altogether unlike most treatises on Relativity.

M. Meyerson makes no attempt to state the theory in popular terms for non-mathematicians. He sees clearly that this cannot be done. And, on the other hand, there is not a single mathematical formula in the book. He modestly counts himself among 'the profane'; but it is quite evident that he has read very widely and deeply in the works of Einstein, Weyl, Eddington, Planck, and other masters. And he has read with understanding; for wherever there is a pitfall M. Meyerson sees it and avoids it. I do not know whether M. Meyerson's book would be of much use to readers who are not already tolerably familiar with the conceptions of the Special and General Theories of Relativity; but to those who are it will set these theories in a new light and reveal historical affinities which have been ignored before.

The author regards the General Theory of Relativity as the latest step in the attempt to explain nature geometrically, which has been going on since the time of Plato. In this connexion he draws a very interesting parallel between the theory and that of Descartes, and a very interesting contrast between it and the *Naturphilosophie* of Hegel and his immediate followers. The Cartesian and the Hegelian theories of nature agree in wishing to deduce as much and to have as few brute facts as possible. They agree in the immense vogue which they enjoyed for some time; and they agree in now being as dead as mutton. They differ profoundly in that the former is a theory stated in terms of space and geometry and using nothing but mathematical reasoning; whilst the latter uses predominantly qualitative conceptions and eschews mathematical deductions. In these respects we may regard the General Theory of Relativity as a continuation of the Cartesian scheme, based on a much wider and more accurate knowledge of the facts and endowed with much more powerful mathematical apparatus. It bears no resemblance to the Hegelian *Naturphilosophie* except in its claim to be as all-embracing and as deductive as possible. Hence the downfall of the *Naturphilosophie* after its immense popularity is not necessarily ominous for the General Theory of Relativity. But the downfall of the Cartesian physics, and its replacement for so many years by the Newtonian physics, has its lessons for the General

Theory of Relativity. In spite of our natural tendency to seek for geometrical explanations of nature, and in spite of the success with which the Cartesian physics supplied these, it was stopped in mid-career and replaced by the Newtonian conception of central forces, which is a decline from the ideal of geometrical explanation. And it is only in the General Theory of Relativity, by means of the conception of variable spatio-temporal 'curvature', that a return to the geometrical ideal has become possible. It is obvious that the General Theory of Relativity might meet with a check of this kind even if it were fully accepted for a while. M. Meyerson specially remarks three points at which there still lurks contingency which the General Theory has not rationalised; *viz.*, (1) The apparent asymmetry of the time-series, which manifests itself in physics as Carnot's principle; (2) certain discontinuities in space and time, such as atoms, electrons, quanta, etc.; and (3) the fact that the symbols in any mathematical equation must be interpreted to mean such and such *physical* magnitudes before the theory gets any purchase on reality.

M. Meyerson is extremely good on the claim that the General Theory of Relativity is a kind of 'return to Kant,' in that it makes space and time to be forms which are imposed by each observer on nature. I am glad to see that he entirely rejects this extraordinarily silly mistake. He says (p. 212), 'from the beginning the relativists have devoted themselves to putting everything that has to do with spatial and temporal determinations in a form which shall be valid for *all* observers whatever. It is evident that this can be done only by detaching them from the observing subject and giving them an existence independent of the Ego, *i.e.*, by putting them into the Thing-in-itself.' This seems to me to be exactly correct. Closely connected with this is M. Meyerson's constant protest against the Positivism of Comte and the Phenomenalism of Mach. Science, according to him, is essentially realistic. It cannot and will not regard its atoms and electrons as mere convenient conceptual machinery; and it refuses to be confined to stating the *de facto* connexions between one sensation and another. He has very little difficulty in showing from the history of science that positivism and phenomenalism are travesties of the actual course which science has followed; and that many discoveries would have been missed if scientists had paid too much attention to the commands of Comte and of Mach.

It is difficult to give an adequate summary of this very interesting book, which consists of a series of essays about Relativity and its connexions with other subjects, strung on a single thread. I will confine myself to one remark in conclusion. M. Meyerson, as we have seen, regards the General Theory as making a great step towards the 'geometrisation' of physics: though he admits that this is done only by introducing into Space-Time itself particularities (such as variable curvature) which would ordinarily be ascribed to matter in space. No doubt this is the interpretation which most of the masters of the subject do put on the theory, and no doubt great weight should be attached to this fact. But it seems to me that some weight should also be attached to the contention of Whitehead in his latest book on the subject, *viz.*, that the really essential feature of the Theory of Relativity is that the laws of nature must be expressible in tensor form. These tensors must then be interpreted; and it is *possible*, though not necessary, and (in Whitehead's view) mistaken, to interpret them in terms of spatio-temporal curvature. I mention this, not in criticism of M. Meyerson, whose book remains an admirable account of the predominant view of the subject, but to show that another interpretation is possible.

C. D. BROAD.

Principia Mathematica. By ALFRED NORTH WHITEHEAD, ScD., F.R.S., and BERTRAND RUSSELL, M.A., F.R.S. 2nd edition. Vol. I., pp. xlvii + 674. Cambridge University Press. 42s.

In preparing the second edition of their great work the authors have left the text unaltered, to save the great labour which would be entailed in changing the references, but have added a new introduction, three new appendices, and an index of definitions. The introduction, after noticing as the most definite advances in the last fourteen years the substitution by Dr. Sheffer of the one indefinable " p and q are incompatible" for the two " $\text{not-}p$ " and " p or q " and the consequent reduction in the number of primitive propositions by M. Nicod, is mainly devoted to a new exposition of the "Theory of Types," giving a much simplified account of the construction of matrices and other propositional functions. An attempt is made to dispense with the "Axiom of Reducibility," which seemed indispensable as a basis for both Mathematical Induction and Dedekindian Section, which are the essential foundations of algebra and modern analysis. In regard to mathematical induction it is shown in one of the appendices how, by a most ingenious method involving functions of the fifth order, all the required results can be established without using the objectionable axiom; but with respect to well-ordered series, Dedekindian Section and the theory of real numbers no such success has been achieved, and the authors conclude that "It might be possible to sacrifice infinite well-ordered series to logical rigour, but the theory of real numbers is an integral part of ordinary mathematics, and can hardly be the object of a reasonable doubt. We are therefore justified in supposing that some logical axiom which is true will justify it. The axiom required may be more restricted than the axiom of reducibility, but, if so, it remains to be discovered."

Perhaps the principal philosophical interest of the new edition lies in the third appendix entitled "Truth-functions and others," which discusses a new assumption, attributed to Wittgenstein, which is used in all the new work instead of the "Axiom of Reducibility," the assumption that a propositional function can only enter into a matrix through its values, i.e., that any function of functions $F(\phi!)$ can be constructed from the values of $\phi!$ by truth-operations and generalisation. It is pointed out that, even if false, this assumption could be made a mere matter of definition, by deciding that in mathematics "all functions of functions" is to include only such as fulfil the required condition. Nevertheless the appendix is devoted to the gratuitous inquiry into whether the assumption is in fact true, or rather into the prior question "whether all functions of propositions are truth-functions. Or, more precisely, can all propositions which do not contain apparent variables be built up from atomic propositions by means of the stroke?" (The "stroke" is the symbol for incompatibility.) It is perhaps unfortunate that the authors never return to what they have called the more precise statement of their question, but discuss it throughout in its first form, whether all functions of propositions are truth-functions. They take as *prima facie* instances to the contrary, " A believes p " and " p is about A ". Obviously neither of these is a truth-function of p , so if all functions of propositions are truth-functions, they cannot be functions of p at all. This is the view of the authors, who, following Wittgenstein in essentials, show a fundamental distinction between the way p occurs in " A believes p " and the way it occurs when it itself or a truth-function of it is asserted. But even so it seems hard to say that " A believes p " is not in any sense a function of p ; and the whole question is much simpler when put in the "more precise" form, "can all propositions which do not contain apparent

variables be built up from atomic propositions by means of the stroke?" For on Wittgenstein's theory it can be seen, without using any of our authors' new distinctions, that " A believes p ," though not a truth-function of p , is a truth-function of other atomic propositions. Also this is the important fact, that truth-functions (and generalisation) suffice for the construction of all propositions out of atomic propositions, so that even if in any sense there are other functions of propositions these are not really essential or indispensable.

With regard to " p is about A " it is not clear what the authors' view really is. They put forward the theory that a particular is a class of facts that have to one another "particular-resemblance". Thus "when we say that Socrates is a constituent of the fact that Socrates is Greek, we mean that this fact is a member of the class of facts which is Socrates". This account is put forward as one which those who deny the legitimacy of analysis need not reject; such it may be, but it is hard to see how the authors of *Principia Mathematica* can consistently adopt it. For instance, what account could they give of the proposition, "The fact that Socrates is Greek and the fact that Socrates is wise have particular-resemblance"? How is this to be analysed as a truth-function of atomic propositions?

F. P. RAMSEY.

Die Mathematische Methode. BY O. HÖLDER. Berlin: J. Springer, 1924. Pp. x + 563.

During the last few decades there has been a tremendous growth in the interest of thinkers of all classes in logical and mathematical ideas. This is due for the greater part to the important work of the Mathematical Logicians who have quietly and definitely constructed a new branch of knowledge out of a nucleus of isolated ideas which have hovered about since the times of the Greeks.

The new interest of the general thinker in mathematics and logic is, however, due in part to another cause. The triumphs of the Theory of Relativity have had an importance far beyond the domain of Physics. The theory has shown perfectly conclusively and definitely that the mathematical or logical method of studying the structure of the external world is extraordinarily successful, indeed vastly more successful than any method previously used. For it must be recognised that the premisses of the Theory of Relativity are in a new key. They are 'structural premisses' in a sense in which no premiss in a scientific theory has ever before been structural. One has only to contrast the assumption that gravitational attractions follow the inverse square law with the Invariance Postulates of the Theory of Relativity to see the deep and significant difference.

Now that it is well recognised that the new structural premisses of Physics are pointing the way to advances in Science of all kinds, the Principles of Mathematics and the Mathematical Method become of great importance not only to that small class of people to whom structure in itself is the most beautiful thing in the world but to the much vaster class of people who are interested in the development of scientific theory. For although the conditions of the various sciences vary very much, yet it is difficult to believe that any science exists which is too backward for the application of the structural ideas of mathematics.

It is therefore interesting to chronicle the appearance of Professor Hölder's book *Die Mathematische Methode*. The scheme of the book is comprehensive and includes the discussion of the mathematical method in many different aspects.

His first part is concerned with examples from various different domains.

He discusses the nature of Geometry and Mechanics, mathematical continuity, analytical geometry, the theory of manifolds, the theory of limits, functions and the nature of numbers of various kinds.

The second part is called the Logical Analysis of Mathematical Method. In it Professor Hölder gives his views on Theory of Knowledge.

The third part is concerned with experience and the method. In turn he discusses the axioms of geometry, classical mechanics, and Physics. In appendices Professor Hölder treats a variety of topics, including the relation between induction and deduction, and he also gives an account of the various Paradoxes which are of historic interest to the student of the Mathematical Method.

In attempting to treat in a single volume this tremendous range of subjects, Professor Hölder has had a formidable task. It is open to question how far it is desirable to put together the philosophical discussions of various very difficult subjects which belong to epistemology with, on the one hand the exposition of modern ideas of number, sets of points, limits, theory of functions, and so on, and on the other the discussion of the relation between the scientific theories built on these abstract ideas and the data of experience and observation. It is manifestly almost impossible to treat the subjects in such a restricted space in a way which would be satisfactory from three very different standpoints. And further, it is surely a pity to imply, as the treatment in this book seems to imply, that the use and understanding of mathematical ideas necessarily requires the solution of the many intricate and delicate epistemological problems which are mentioned. However, the book will be useful no doubt to some students of scientific method and also to those who want an introduction to the Principles of Mathematics, though those of the latter class who read English would be better advised to go straight to Russell's *Introduction to Mathematical Philosophy*.

D. M. WRINCH.

Essays in Metaphysics. University of California Press, Berkeley, 1924. (Cambridge University Press for British orders.) Pp. 220.

The plan of publishing an annual volume of philosophical lectures delivered under the auspices of the University of California was inaugurated in 1923 with *Issues and Tendencies in Contemporary Philosophy*. The present work, if not quite up to the standard of *Issues and Tendencies*, is certainly an interesting and valuable contribution to the subject.

The book opens with a lecture by Prof. Laird on "The Character of Metaphysical Inquiry". According to the author, "the peculiar office of philosophy is precisely its readiness and its anxiety to withstand logical criticism from every relevant quarter, and metaphysics is workable, in a measure at least, just because the various possibilities in the way of serious criticism may themselves be organised into certain broad principles of criticism" (p. 20), for otherwise metaphysics would be helpless before the infinity of possible criticisms, which it can only deal with by dividing them into classes and so making its task finite. While the author certainly does not err in stressing the critical side of philosophy too little, he insists that the negative function of criticism has its positive implications, since it cannot be fulfilled without an examination of the positive characteristics and relations of different principles with a view to determining their "relevance" or "irrelevance". "The Philosophy of Nature in the Light of Contemporary Physics," by Mr. Lenzen, is a good general summary of the philosophical tendencies in present-day physics as regards the structure of the material universe.

Dr. Dennes in "The Method of Metaphysics" contends that a strictly deductive metaphysics is impossible on account of the difficulty of establishing first principles, and concludes that the only tenable alternative is a metaphysics which rests on an "inspection" of certain all-pervasive characteristics of reality, as Prof. Alexander's and Croce's claim to do. The argument is suggestive, but I wish the author had made it clear whether he means to give any place at all to a *a priori* deduction within his philosophy, and, if not, how he would avoid the obvious objections to a purely empirical metaphysics. The alternative is surely not—either all deduction or no deduction at all—as some passages in the article would suggest. The discussion of the question as to the perfection of reality (p. 67 ff.) is of great interest. In "The Idea of the Ultimate," by Prof. Loewenberg, it is contended that "the ultimate" should be treated as a fundamental category in metaphysics. The author insists on the dilemma that if the ultimate is viewed logically as immediate certainty, we are in danger of "a mystic solipsism of the present moment," and that, if it is viewed ontologically, all our knowledge as dealing with a transcendent reality becomes uncertain. It seems to me very doubtful whether the two senses of "ultimate" are not too radically different to be treated as they are here, but a further development of the author's views on the difficulty would be very interesting. The article has special reference to Santayana's philosophy.

As in the previous volume Prof. Prall attacks the conception of objective value. His position is that any value is dependent partly on our feeling of it as valuable and partly on the nature of the object, and is, therefore, neither subjective nor objective but a synthesis of both. However, he apparently means to deny that we have any right to say that values are attributes of the object or mental state which is valued, but only of its appearance to us in the moment of valuing it. His argument, though very ingenious, does not seem to me in the least conclusive. His main contention is that, since (1), as he holds, all values are aesthetic, and since (2) aesthetic value cannot belong to the (physical) objects we call beautiful, no value, including specially moral value, can be objective or independent of our apprehending it as value. But, even if one granted the first two points, I do not see that the argument would prove anything more about moral values than that they could not be ascribed to physical objects, not, as the author maintains, that they are non-objective relatively to our acts of valuing them. The lecture has special reference to Prof. Laird's views.

Prof. Adam in "Reason and Experience" analyses various meanings of the terms in question, and concludes that the best interpretation of "reason" is "that it stands for that active process of interpreting and organising, of building out and filling in all data of experience so that our meanings and our nature are portrayed in the structures which we acknowledge as significant and as real". He avoids subjectivism by adding that this process of invention and construction may at the same time be a process of discovery. The last article by Prof. Lovejoy on "The Discontinuities of Evolution" deals with the question as to whether the laws of nature have evolved. It seems to me rather unfortunate that the question has been stated in this form, since it suggests that a law might change in such a way that under the same conditions a different effect would take place, but this is not the author's meaning. He is only contending that new entities like organisms may arise which are subject to laws that cannot be identified with, or made a particular case of, the laws governing the pre-existent entities.

A. C. EWING.

The Psychology of Religious Mysticism. By JAMES H. LEUBA. London: Kegan Paul, Trench, Trubner & Co., Ltd., 1925. Pp. xii, 336. 15s. net.

This is a book the value of which it is difficult to estimate fairly, largely because two different aims, which to the present reviewer seem wholly incompatible, have shaped its construction. On the one hand it proposes to describe the nature, technique, motives, and moral effects of mystic experience, and does so with great fulness and vivacity; on the other, it seeks at every point to prove that this same mystic experience, in so far as involving relationship to a transcendent God, is illusory. An oddly unscientific confusion of these two intentions has greatly lessened its worth for the exact student, who will still have to read his Delacroix if he wants a sure guide.

At no point are we clearly told how Professor Leuba would relate the two ideas, "mysticism" and "religion". (Chapter I. deals with this subject, but leaves it unsettled.) Now and then they seem to be co-terminous, at other turns in the argument they can be easily differentiated. Broadly speaking, when conducting his propaganda against theism the writer identifies the two, and assumes that good reasons for repudiating the wilder extravagances of some mystics are also fatal to theistic religion as such. But this is obviously not true of prophetic faith, say in its Old Testament form. In fact, Professor Leuba appears to imagine there are for Christian thinkers only two possible alternatives: a rational commonsense religion, or a mysticism in which the self is dissolved in Deity. In view of recent work like that of Otto, we are disconcerted by a writer who to-day can put down the following sentence: "It seems to us that a reference to the facts establishes the existence of two types of religious relation: in the one, it consists in objective, business-like transactions with God; in the other, it consists in communion or union with God or even in absorption in the divine Substance" (p. 2). The facility with which communion is here made to merge in absorption, by way of a simple 'or even', as if moral relationships between God and the soul were of no account, must give the most careless reader pause. The idea of an ethically qualified fellowship with God, as enjoyed and preached by St. Paul, Augustine, Luther hardly comes into view.

Chapter II., on mystical ecstasy as produced by physical means, is a fascinating collection of materials; their interpretation is another matter. The influence of ether and nitrous oxide gas in causing enthusiastic and sublime feelings is taken to have a very important bearing on the question how revelation comes, or is thought to come, to religious men. All through a parallel is worked hard between experiences of a spiritual and a purely physical kind. Later, some Christian mystics of repute are studied very carefully, such as St. Catherine of Genoa, Madame Guyon, and Mlle. Vé. Great mystics, we are told, became great "because they were personalities remarkable by the energy of their will-to-happiness-and-distinction" (p. 89). Truly this is to reduce nobility to commonplace. Professor Leuba would deny outright the claim of the religious mystics to love God with a measure of disinterestedness. They are intent on what they can get from Him, not on communion with Him for His own sake. "The mystic seeks, and, as he thinks, finds union with a loving God, the embodiment of all perfections; or, rather, he seeks that which the divine Presence would bring in the way of peace, affection, self-assurance, self-respect, etc. To realise the presence of the God of Love is the mystic's method of securing the satisfaction of his essential wants" (p. 120). All is egoism in the last issue, though the egoism is often of a highly refined sort.

The place of sex in religion is discussed with more good sense by far

than some recent writers have shown. Even here, however, we find a tendency to turn the sexual sensations that accompany religious feeling into a cause of the feeling.

Many interesting details in the technique of mystic practice are set out lucidly, with full documentation. Throughout, indeed, the relevancy and fairness of the quotations leave nothing to be desired. Professor Leuba points out how it is a gross error in certain systematisers to confuse degrees of ecstatic trance with degrees of moral perfection; and here all representatives of prophetic religion would agree with him. Not the least valuable sections of the book are those which deal with ecstasy, in the mystic, the poet, the moral struggler, and the man of scientific inspiration.

I fear that Chapter XI., on the sense of invisible presence and Divine guidance, will prove a difficulty for people who mix a little humour with their logic. It would scarcely be unfair to epitomise its argument as follows: You must not believe that you really enjoy the presence of God; this conviction of a significant Presence occurs elsewhere than in the religious life, yet there is nothing in it. "In a room with a screen, we may 'feel' someone on the other side of it with all the intensity and definiteness which usually come with sight and with hearing—and yet no one may be there" (p. 288). Professor Leuba has a strong belief in the cogency of his argumentation which will hardly be shared by those who have learned from prophets and apostles what religion can be. I am unable to agree with his view that his book "seems to show" that the Ultimate Power does not stand to man in a personal relation. I have felt, rather, that the great religious pioneers and leaders, who lived in direct communion with the unseen, would accept much of what he has to say descriptively of the less responsible mysticism, while putting his criticism of higher religion aside as at times unbelievably irrelevant and external.

H. R. MACKINTOSH.

La Pensée religieuse de Descartes. BY HENRI GOUHIER. Paris: J. Vrin, 1924. Pp. 328.

There is a character of finality about M. Gouhier's volume, not so much in the views he expresses as in the completeness of his collection and analysis of the relevant material. The value of this study appears to me solely historical. The attitude of Descartes to religion has been so diversely represented that it is interesting to have the subject discussed in its detail. A long notice would be required critically to estimate M. Gouhier's conclusions.

From the time of Baillet who published the life of Descartes in 1691 there have been those who have regarded him as pre-eminently a Christian apologist. The writers of the nineteenth century regarded him chiefly as a rationalist, resorting to various expedients, mentioned by M. Gouhier, to explain away facts which seem contrary. M. Adam, the editor of the standard French edition of his works, said that Descartes played a double game in which there was something of the nature of comedy, adhering to common religious beliefs and practices out of curiosity and from the force of tradition. To M. Liard's contention that Descartes' fundamental interest was physics and mathematics, with his metaphysics as a mere appendix, M. Gouhier objects that the metaphysical expositions precede the physical. M. Adam, however, suggested a valid reply to this in maintaining that the metaphysics is only prolegomena to the physics. But against that M. Gouhier urges that the *Méditations* contain no word of physics and

that Descartes himself says, "Je défends la cause de Dieu". But surely that phrase is very ambiguous, and may not bear the weight of religious or theological purpose which the author tends to put on it. He rejects the recent view of M. Espinas that Descartes' chief aim was to explain the Roman Catholic doctrine of transubstantiation, with the automaton theory of animals as the starting point of his whole philosophical construction, maintaining that such a view is not supported by facts. Similarly the suggestion of M. Blanchet that Descartes was concerned to find a metaphysics which would unite Catholicism with his new theory of physics is opposed on the ground that he never formulated any such problem of "science and religion".

Taking up the enquiry anew, and carefully surveying all the available evidence, the author denies the possibility of any adequate single portrait of Descartes: his life shows a succession of attitudes. His early letters to Beeckman, in 1619, speak of an "incredible ambition," of an "infinite work," in a series of treatises the titles of which were not decided. In the *Cogitationes privatae* Descartes suggested that the philosopher has need of inspiration such as that of the poets, and he developed a distinctly banal symbolism of sensible objects as a means of knowledge of the divine. Later he abandoned the view that such objects could give any such knowledge. In 1628 he spoke of his intention to compose a work on divinity, and during his first nine months in Holland, whither he went not for tolerance but to escape the distractions of Paris, he was occupied with metaphysics and the work on divinity. If we could follow the thought of Descartes in the winter of 1629-1630, M. Gouhier thinks we should find two currents, separated in origin, uniting to give birth to the theory of eternal truths—the offspring of metaphysics and physics. Though Descartes cultivated metaphysics for itself, he never ceased to see in it an introduction to religion. He regarded his thought, including his physics, as a Christian philosophy. Yet, as M. Gouhier remarks, the God of whom we hear is not "the God of love who gave His Son to men"; in the talk about the world there is very little on the initial fact of creation; and there is no use of "revealed" instruction with reference to morality. The problems whence man comes, whither he goes, and why he is so imperfect here are not considered. Descartes was hardly interested at all in sin, and M. Gouhier asks: "What is a Christian philosophy without sin?"

The fundamental issue centres in the relation of reason and faith. To this the author gives lengthy consideration carefully marshalling the data. According to Descartes faith is by nature and origin absolutely different from rational knowledge. Faith is an act of will. But will is infinite, and as such can affirm what goes beyond reason which is finite. Faith is the result of grace, a divine gift, for "the road to heaven is not less open to the most ignorant than to the most learned". The doctrines of religion are thus to be received by faith: the mystery of the Trinity is purely of faith, and cannot be known by natural light. But on the other hand reason is to be unfettered and is to follow its own methods with regard to anything which our minds can apprehend without supernatural aid. Descartes, says M. Gouhier in effect, had too profound a "feeling" or "impression" of infinity to acknowledge any pretension of reason to give a representation of it, and he held a theory of reason and faith as separate enough to protect the divine ineffability, and intellectualist enough to save the legitimacy of metaphysic.

Yet M. Gouhier's survey does not leave us with the impression that Descartes had one predominating purpose. That he had a deep religious interest is hardly open to doubt, yet some of his remarks on particular theological doctrines savour of a spirit of temporary accommodation. For the rest it appears probable that his particular interests in physics, in

metaphysics, and theology were independently more real than his idea of their relation was clear and distinct. Whatever M. Gouhier himself may think about it, it seems to me a mark of the merit of his book as a survey of the facts, that it leaves one with no very definite conception of Descartes' thought on religion, except that it was probably itself in the main indefinite.

A. G. WIDGERY.

Idealism as a Philosophical Doctrine. By R. F. ALFRED HOERNLÉ, M.A., B.Sc. Hodder & Stoughton, London, 1924. Pp. ix + 189.

Two books in this series—the "Library of Philosophy and Religion"—have already received favourable notice in *MIND*; Prof. Hoernlé's contribution on *Idealism* is also admirably fitted for its purpose, namely, to provide "a book which, like a map, would help a beginner to thread his way through the tangled mazes of idealistic theory". It is extraordinary how much Prof. Hoernlé manages to get into such a small book as this. In Chapter I. he traces various meanings of the words *Idea*, *Ideal*, *Idealism*, in order to show their historical connexions and their development in the Idealism of Berkeley on the one hand, and in that of Kant and Hegel on the other. The former, Prof. Hoernlé describes as "spiritual pluralism," the latter as "absolutism," and he hopes by thus distinguishing these two types—the one "interpreting reality as a society of spirits," the other "interpreting it as appearances of the Absolute"—to provide a map through the idealistic maze. As in the case of most maps, however, this well-marked distinction sacrifices accuracy to convenience of size, and brings together philosophers whose views should be sharply distinguished. It is not a little surprising to find attributed to Dr. McTaggart the view that "Berkeley's is the only genuine and satisfactory type of idealism" (p. 57). One cannot but feel that such a statement betrays a serious misconception of Dr. McTaggart's point of view. There is little but the name common to the philosophy of Berkeley and to that of the author of *The Nature of Existence*.

The fact of the matter is that Dr. McTaggart's metaphysic does not fit into any of the neat compartments devised by Prof. Hoernlé. Are there not more affinities between Berkeley and Russell's *Problem of the External World* than between the former and McTaggart? One is left wondering whether *Idealism as a Philosophical Doctrine* is a possible title for a book dealing both with Berkeley and with Hegel, while it excludes Mr. Russell and classifies McTaggart with Berkeley as a "spiritual pluralist". It seems to be the case that "idealism" is no longer a useful label.

There are, however, indications that for Prof. Hoernlé idealism signifies fundamentally a certain attitude to the universe and to the world in which we live—an attitude which regards the universe as the satisfaction of a spiritual need. Thus he says, "The enduring appeal of the new idealism of Kant and Hegel lies just in this, that the problem which it sought to meet is still with us, being inherent in the very nature of our civilisation; that the spiritual need which they strove to meet is felt even more poignantly at the present day". This does represent to some extent that development of Idealism, which is associated with the name of Bradley and, more accurately, with that of Bosanquet. As descriptive of their metaphysic we may endorse Prof. Hoernlé's summing up: "To affirm the Absolute is to affirm that 'real' and 'ideal,' 'fact' and 'value,' are one" (p. 159).

The detailed exposition of Bosanquet's philosophy with which the book closes is excellent, clear, comprehensive, and, as is to be expected, sympathetic.

It is probable that this little book will serve its purpose of introducing a student to the various "types of idealism," and will serve to indicate how divergent those types have become.

There is a useful and adequate bibliography.

L. S. S.

Ethik als Wissenschaft. By DR. MARTIN KELLER. Orell Füssli, Zürich, 1925. Pp. 147.

This short volume, based on a thesis which obtained the doctorate at Zürich University, treats a difficult and very important subject with marked ability, and should be of great interest to any students of ethics. It is primarily an attempt to combine a denial of the logical objectivity of ethical judgments with a doctrine that gives them a metaphysical objectivity based on the conception of Reality as teleological. Even if one disagrees strongly with the author's view that so-called ethical judgments are "neither true nor false" and therefore not judgments at all, and is very sceptical about the possibility of reconciling this with any "metaphysical" objectivity, one can appreciate the value of an attempt in this direction by one who, while unable to treat ethical judgments as having the objectivity of judgments of fact, yet lays great stress on the importance of ethical and religious experience.

In the first part of the book where the objectivity of ethical judgments is attacked, the most prominent argument used is that these so-called judgments do not conform to the principle of excluded middle, since, while truth does not admit of degrees, goodness does (p. 23 f.). I should have thought that this argument would only show that goodness was not a species of truth, not, as the author thinks, that judgments about the good could not be true, any more than the fact that heat admits of degrees proves that no judgment about heat can be true. The author, however, evidently thinks that the two cases are not parallel, and actually appeals to the ordinary moral consciousness to justify the view that in so-called "ethical judgments" not only the goodness ascribed, but the validity of the judgment itself, is a matter of degree; but the point is not treated at sufficient length. The second part states what kind of judgments connected with ethics are left standing by this criticism, i.e., judgments about means, subordination of desired ends to each other, and the history of ethical views.

The most important and original part of the book is the third in which the author argues for a metaphysical foundation of ethics. Any metaphysical foundation, he insists, presupposes the teleological character of Reality. He had come to the conclusion that "ethical judgments" had no logical objectivity, and therefore were not really judgments at all, that they were reducible to feelings and were neither true nor false, but he now combines this with a metaphysical objectivity. How this can be done it is more difficult to see. Metaphysical value is said (p. 100) to consist in the relations to metaphysical facts which make our ethical experience possible. But these facts and relations have no value in themselves but only value as a means to the experience they make possible, and this experience the author has denied to be valuable except in the sense that we have certain feelings about it. So, as long as what he calls the logical objectivity of ethical judgments is denied, it is difficult to see where real value is to be found in the universe.

A. C. EWING.

Received also :—

- F. Brentano, *Psychologie vom empirischen Standpunkt*, Vol. II., edited by O. Kraus, Leipzig, F. Meiner, 1925, pp. xxiii, 337, 10 M.
- F. Brentano, *Versuch über die Erkenntnis*, edited from his remains by A. Kastil, Leipzig, F. Meiner, 1925, pp. xx, 222, 7.50 M.
- H. J. Watt, *The Sensory Basis and Structure of Knowledge*, London, Methuen & Co. Ltd., 1925, pp. xi, 243, 8s. 6d.
- A. E. Taylor, *Platonism and its Influence*, London, G. G. Harrap & Co., pp. 153. 5s.
- Pauler, A. von, *Grundlagen der Philosophie*, Berlin, W. de Gruyter & Co., 1925, pp. x, 348.
- Jahrbuch für Philosophie und phänomenologische Forschung*, Bd. VII., Halle a.d. S., M. Niemeyer, 1925, pp. x, 769, M. 32.
- Aristotelian Society, Proceedings of the*, 1924-25, London, Williams & Norgate, 1925, pp. 350, 25s.
- Aristotelian Society, Supplementary Vol. V.*, London, Williams & Norgate, 1925, pp. 212, 15s.
- M. Schlick, *Allgemeine Erkenntnislehre*, 2nd edition, Berlin, J. Springer, 1925, pp. x, 375, M. 18.
- S. Meyer, *Die Geistige Wirklichkeit*, Stuttgart, F. Enke, 1925, pp. 260, M. 6.60.
- G. W. Cunningham, *Five Lectures on the Problem of Mind*, Austin, University of Texas Press, 1925, pp. vi, 120.
- L. Vivante, *Note sopra la Originalità del Pensiero*, Roma, P. Maglione & C. Strini, 1925, pp. 295, L. 16.
- S. Cameron, *More Light*, London, Williams & Norgate Ltd., pp. xiii, 75, 3s. 6d.
- P. M. Cordovani, *Il Rivelatore* (Publicazioni della Università Cattolica del Sacro Cuore, Vol. II.), Milan, "Vita e Pensiero," 1925, pp. 483, L. 20.
- P. Wust, *Naivität und Pietät*, Tübingen, J. C. B. Mohr, 1925, pp. xv, 238, M. 8.
- F. R. Tennant, *Miracle and its Philosophical Presuppositions*, Cambridge University Press, 1925, pp. 103, 4s. 6d.
- A. Schweitzer, *The Mystery of the Kingdom of God*, London, A. & C. Black, Ltd., 1925, pp. 275, 6s.
- V. Blake, *Relation in Art*, London, H. Milford, 1925, pp. xxiii, 325.
- E. Uitz, *Der Künstler*, Stuttgart, F. Enke, 1925, pp. 64, M. 2.70.
- G. del Vecchio, *La Giustizia*, 2nd edition, Bologna, N. Zanichelli, 1924, pp. 79, L. 7.
- B. Croce, *The Conduct of Life*, trans. by A. Livingston, London, G. G. Harrap & Co. Ltd., pp. xiv, 326, 7s. 6d.
- L. Tolstoy, *What then must we do?* trans. with an Introduction, by A. Maude, London, H. Milford, 1925, pp. xxvii, 403, 2s.
- F. A. M. Spencer, *The Ethics of the Gospel*, London, G. Allen & Unwin Ltd., 1925, pp. 255, 7s. 6d.
- H. A. Silverman, *The Economics of Social Problems*, London, University Tutorial Press, 1925, pp. xi, 426, 5s. 6d.
- M. N. Sircar, *The System of Vedantic Thought and Culture*, University of Calcutta, 1925, pp. xi, 328.
- M. de Wulf, *Histoire de la Philosophie Médiévale : II.*, Paris, F. Alcan, 1925, pp. 326, 20 fr.
- L. Noël, *Notes d'Épistémologie thomiste*, Paris, F. Alcan, 1925, pp. vii, 242, 9 fr.
- M. F. Shepperson, *A Comparative Study of St. Thomas Aquinas and Herbert Spencer*, Pittsburgh, 1923, pp. 85.

- M. Sticco, *Il Pensiero di S. Bernardino da Siena*, Milan, "Vita e Pensiero," pp. viii, 202, L. 6.
- Immanuel Kant (1724-1924)* (Pubblicazioni della Università Cattolica del Sacro Cuore, VII.), Milan, "Vita e Pensiero," 1924, pp. 323, L. 15.
- Immanuel Kant, 1724-1924*, Yale University Press (H. Milford), 1925, pp. 88, 9s.
- X. Atanassievitch, *La Doctrine Métaphysique et Géométrique de Bruno*, Paris, Presses Universitaires, 1923, pp. 156.
- U. A. Padovani, *Vito Fornari: Saggio sul Pensiero Religioso in Italia nel Secolo Decimonono*, Milan, "Vita e Pensiero," pp. 219, L. 12.
- J. Wahl, *The Pluralist Philosophies of England and America*, trans. by F. Rothwell, London, Open Court Co., 1925, pp. xvi, 324, 12s. 6d.
- E. Chiochetti, *La Filosofia di Benedetto Croce*, 3rd edition, revised and enlarged, Milan, "Vita e Pensiero," pp. xi, 335, L. 15.
- H. Driesch, *The Crisis in Psychology*, Princeton University Press (H. Milford), 1925, pp. xvi, 275, 11s. 6d.
- K. Dunlap, *Old and New Viewpoints in Psychology*, London, H. Kimpton, 1925, pp. 166, 10s. 6d.
- M. Halbwachs, *Les Cadres Sociaux de la Mémoire*, Paris, F. Alcan, 1925, pp. xii, 404, 25 fr.
- H. Zwaardemaker, *l'Odorat* (Bibliothèque de Psychologie Expérimentale), Paris, G. Doin, 1925, pp. 305, 15 fr.
- A. Kronfeld, *Psychotherapie*, 2nd revised and enlarged edition, Berlin, J. Springer, 1925, pp. xiv, 309, M. 12.
- J. Walker, *Factors contributing to the Delinquency of Defective Girls* (University of California Publications in Psychology, 3, 4), Berkeley, University of California Press, 1925, pp. 60.
- C. Spearman, *A Measure of "Intelligence" for use in Schools*, London, Methuen & Co. Ltd., 1925, pp. 20, 1s.
- J. E. Downey, *The Will-Temperament and its Testing*, London, G. G. Harrap & Co. Ltd., 1924, pp. v, 339, 7s. 6d.
- A. D. Weeks, *Psychology for Child Training*, London, D. Appleton & Co., 1925, pp. xi, 312, 7s. 6d.
- G. F. Morton, *Childhood's Fears*, London, Duckworth, 1925, pp. 284, 7s. 6d.
- R. Blatchford, *More Things in Heaven and Earth*, London, Methuen & Co. Ltd., 1925, pp. 124, 3s. 6d.
- P. Choissnard, *Essai de Psychologie Astrale*, Paris, F. Alcan, 1925, pp. xvii, 165, 12 fr.
- R. St. Clair, *Analecta*, London, A. W. Board, pp. 21, 2s.

VIII.—PHILOSOPHICAL PERIODICALS.

SCIENTIA. July, 1924. **M. La Rosa.** *Prove astronomiche contrarie alla relatività. Parte I^a: Le «stelle variabili».* **H. Driesch.** *Le vitalisme.* **W. B. Pillsbury.** *Recent Naturalistic Theories of Reasoning* (from Ann Arbor (Mich., U.S.A.), University of Michigan, Psychological Library). [Since 1909 a number of works dealing with the problem of thinking have appeared which are in essential agreement although they are the products of four authors working quite independently, namely, Dewey, Goblott, Rignano and Pillsbury. The point of view of these works is not by any means the traditional one. The problem is approached by an empirical study of the actual processes involved rather than by deducing an opinion as to what they should be from some preconceived opinion. There are, in general, three steps in the solution of the problem; the first is the understanding of the difficulty, the second is to find a solution of the difficulty and is a process of free suggestion, and the third is the process of proof and consists in the testing and confirmation of a solution which seems valid. With regard to the process of proof—the two recognised forms are deduction and induction. There is no connection between the way in which a solution is obtained and the form of proof used. The logician is frequently in error on this point, in thinking that the process of proving is the method of deriving the conclusion.] **A. Landry.** *L'idée de progrès: son influence sur le développement social.* Book Reviews.—August, 1924. **M. La Rosa.** *Prove astronomiche contrarie alla relatività. Parte II^a: Una nuova teoria delle «stelle variabili».* **J. C. Bose.** *The Ascent of Sap in Plants.* **F. Mentré.** *La Nologie, science des types intellectuels.* **M. Fanno.** *Problèmes fondamentaux de politique domaniaire.* Book Reviews.—September, 1924. **G. Fano.** *I gruppi di trasformazione nella geometria.* **M. Born.** *Recherches récentes sur la théorie de l'affinité chimique.* **E. S. Russell.** *The Question of Vitalism: Psychobiology.* **U. Borsi.** *Le pacte de la Société des Nations et le projet de traité d'assistance mutuelle entre les États.* Book Reviews.—October, 1924. **G. Fano.** *L'Analysis Situs. Parte I^a: Lo studio intuitivo del continuo.* **F. Kottler.** *Considérations de critique historique sur la théorie de la relativité. I^{ère} Partie: De Fresnel à Lorentz.* **A. P. Mathews.** *The Mechanistic Conception of Life.* **J. Lescure.** *La théorie des crises et l'anarchie économique contemporaine.* Book Reviews.—November, 1924. **G. Fano.** *L'Analysis Situs. Parte II^a: L'Indirizzo combinatorio.* **F. Kottler.** *Considérations de critique historique sur la théorie de la relativité. II^{ème} Partie: Henri Poincaré et Albert Einstein.* **A. V. Hill.** *The Transformations of Energy in the Contraction of Striated Muscle.* **C. Vallaux.** *Nouveaux aspects du problème des frontières.* Book Reviews.—December, 1924. **H. Reichenbach.** *Die relativistische Zeitlehre.* **J. Comas Solá.** *Nueva teoría emisiva de la luz y de la energía radiante en general.* **H. De Vries.** *Unsuccessful Species.* **R. Le Conte.** *Les migrations humaines.* Book Reviews.—January, 1925. **F. Severi.** *Elementi logici e psicologici dei principi di relatività.* **O. Lodge.** *Matter and Energy.* **P. Teilhard de Chardin.** *L'histoire naturelle du monde. Réflexions sur la valeur et l'avenir de la systématique.* **L. Le Fur.** *Les bases juridiques de la Société des Nations.* Book Reviews.—February, 1925.

F. Severi. *Esame delle obiezioni d'ordine generale contro la relatività del tempo.* **E. Rothé.** *Les tremblements de terre récents et l'état actuel de la sismologie.* **N. Paton.** *Vitalism* (from the Institute of Psychology, Glasgow University). [The essential question of vitalism may be stated as follows: Do living beings behave in a manner so fundamentally different from dead things that to explain the difference it is necessary to postulate the intervention of some agent or agents in the case of the one which are not operative in the case of the other? If the vitalists, who claim that the operation of special and distinct forces must be involved to explain life, had first studied the characteristics of life in its simplest forms and then step by step traced the way in which the more complex forms have been evolved, their attitude would probably have been somewhat modified. There is now good evidence of the formation of highly complex organic substances from inorganic matter apart from living matter under the influence of colloids acted upon by solar energy and of at least the first steps in the formation of living matter. Living matter, simply in virtue of its complex chemical nature, is itself always breaking down into simpler non-living substances, and in this process energy is liberated and may be used for reconstruction. Destructive and constructive changes in fact go on side by side. Life indeed implies a constant breaking down and a constant building up. A thing is living only in virtue of constant chemical change. Life is a form of molecular movement and of chemical change. Much is now known as to the interaction of the living unit and its environment, and the important question is how far these interactions can be explained in terms of the action of recognised forces which determine the behaviour of dead matter.] **R. A. Orgaz.** *El Pan-americanismo y la Sociedad de Naciones.* Book Reviews.—March, 1925. **G. Mie.** *Das Problem der Materie und die Relativitätstheorie.* **S. Meunier.** *Enseignements donnés à la Géologie par les Volcans de la Lune.* **C. Ranzoli.** *Sulla pretesa limitazione dei sensi.* **F. J. C. Hearnshaw.** *Industrial Unrest.* Book Reviews.—April, 1925. **G. Mie.** *Das Problem der Materie und die Relativitätstheorie. II. Theil: Die Relativitätstheorie.* **E. W. Maunder.** *The Rotation Periods of the Sun.* **U. Pierantoni.** *I microrganismi nell'economia animale.* **E. Laskine.** *La Société des Nations et l'Impérialisme colonial.* Book Reviews.

REVUE NÉOSCOLASTIQUE LE PHILOSOPHIE. xxvii Année. Deuxième Série, No. 6, Mai 1925. **D. O. Lottin.** *La définition classique de la loi.* [St. Thomas defines law as quaedam rationis ordinatio ad bonum commune, ab eo-qui curam communitatis habet promulgata. As to the sources of this definition, the mention of the representative of the community as the efficient cause of the law comes from the Pandects and Isidore, the specification of its final cause as the "common good" has the same origin. The requirement that a command must be promulgated before it can be regarded as a law is from Gratian. The conception of the law as ordinatio rationis is due to St. Augustine's conceptions of the eternal divine law, and Aristotle's of the civil law, as given in the *Nicomachean Ethics*. The combination of all these data into a single definition appears to be the original achievement of Thomas himself. To be continued.] **L. Noël.** *Le problème Kantien.* [The fundamental problem of the *Critique of Pure Reason* is neither the justification of the conception of causality against Hume's criticism nor yet that of the possibility of "synthetic judgments a priori," but a still more fundamental one, which is stated in Kant's letter of February 21, 1772, to Marcus Herz. In the *Dissertation* of 1770 Kant had maintained that sense represents things as they seem, understanding (intellectus) as they are. But Kant at the same time and always held fast to the doctrine of representative perception. Hence the difficulty raised in his letter to Herz, how can the mind establish any contact with

reality? The intellect does not apprehend the real directly, since admittedly we have no intellectual "intuition": nor can the contact be established, as a Thomist would maintain that it is, through the data supplied to the intellect by sense since Kant holds that what sense apprehends is not the extra-mental real, but a subjective effect of it, a *Vorstellung in mir*, a *Bestimmung meines Gemüths*. The Kantian problem then is precisely the problem how, on these assumptions, reality can be apprehended at all; Hume's problem about causation, and even the wider issue about synthetic *a priori* propositions in general, are secondary. The solution of the problem as given in the *Critique* is already predetermined by the form in which it is raised. Kant can only come to the conclusion that we never do make a contact with reality; knowledge must simply amount to the systematisation and regularisation by *intellectus* of data which are "effects produced on my sensibility". Since it can be shown that Kant was familiar with Hume's thought from 1757 on, we must assume that the significance of Hume's treatment of causality only dawned on him when he considered it in the light of his own still more ultimate problem after 1770. His famous phrase about the "dogmatic slumber" from which Hume had aroused him probably exaggerates the importance of Hume's influence on the *Critique* and tends to obscure the truth that Kant's trouble was directly due to the inherent falsity of the Cartesian ultra-rationalism, itself a legacy from the decadence of scholasticism.] **J. Hoffmanns.** *L'expérience chez Roger Bacon*. [A propos of the three recent works of M. Carton on Bacon. High admiration is expressed for M. Carton's ability and erudition, but it is urged that his Augustinian sympathies have led him to under-rate the force and to misconceive the point of Thomistic criticism of an ultra-empiricism which is at bottom "chaotic".] **R. Kremer.** *Bulletin d'épistémologie* (concl.). [Notes on a large number of recent works dealing with various aspects of the theory of knowledge.] Reviews, etc., etc.

RIVISTA DI FILOSOFIA. ANNO xv. N. 4. July-November, 1924.
E. Paolo Lamanna. *La maturazione del criticismo nel pensiero di Kant*. [A study of Kant's earlier works, 1755 to 1770, in comparison with the *Critiques*. There is a "substantial uniformity" in the questions for which Kant sought an answer from philosophy. The questions were more and more clearly formulated as the prolonged search for their answers continued. The problem of knowledge, of the relation of thought to being, was central in Kant's mind throughout.] **Giovanni Vidari.** *Sguardo introduttivo alla "Critica della Ragione pratica"*. [There is no contradiction between the conclusions of the *Critiques* of Practical and of Pure Reason, although the former extends the use and validity of Reason to the noumenal world. The possibility of freedom in the noumenal world had already been shown in the *Critique* of Pure Reason; the *Critique* of Practical Reason is the goal towards which all Kant's philosophy tends; its conclusions leave open every avenue of development for science and for positive faith alike, while strengthening and purifying the concept of morality.] **Giuseppe Tarozzi.** *Kant e l'idea della ragione*. [For Tarozzi also Ethics is the pivot on which the whole Kantian system turns; the principle that the postulates of Practical Reason are incapable of logical proof has as its consequence, if not its intention, to free the sphere of the *ought to be* from disquieting problems, and to restore its purity; but the postulates are not mere hypotheses; that of liberty, for example, is verified in the whole development of ethics and realised in every action.] **Cesare Ranzoli.** *Le illusioni sensoriali e il valore della conoscenza sensibile*. [Shows that neither of

the prevailing views of the illusions of sense is justified—the one, that they are due to the limitations or defects of the sense itself, the other that they spring from false interpretations of the mind. The sensation is not a duplicate of the object, but “is the object itself which is sensed in us, and realised as the act of sensing; in this act are identified the sentient and the sensum, the consciousness of the object, and the object of consciousness”. The fundamental thesis is that in sensation the very external object reveals itself; but (1) this object does not exist independently, with fixed qualities; and (2) its qualities are not ‘impressed’ on or in consciousness.]

Logos. Anno vii., Fasc. 4, Oct. to Dec., 1924. **Hans Much.** *L'essenza della vita.* [An interesting paper on borderland questions of biology and philosophy. The most important characteristic of life is “the combination of manifold events in relation to a unity, a whole, the union of separate functions to contribute to the general advantage of the unitary aggregate”. Stresses the importance in these questions of *pathological biology.*] **Enrico Parese.** *Forza e Diritto.* [Critical notes on an address by Professor Di Carlo, which was directed against the view held by such diverse writers as Ihering, Marx and Menger, who “degrade the function of right to a mere instrument, for the consolidation of a social state of oppression and poverty”. Parese accepts and reinforces the thesis of Di Carlo (and of Rosmini) that right triumphs because it is spiritual, immortal, inaccessible to all material power. Ideal right and force are incommensurable terms:—but positive right (*i.e.*, right as historically realised in human societies) requires force, whether material or psychological, to maintain it, to remove obstacles in its way.] **Hans Cornelius.** *Filosofia dell' arte e storia dell' arte.* [The philosophy of art is not the history of art; the former takes the point of view of the artist, the creative mind, not that of the spectator, the appreciative mind; it “studies the immanent laws of artistic production, inevitably followed, through instinct and unconsciously, by the genuine artists of every nation and of every age”. It is a new study of which the lines were laid down by Hildebrand in 1892, followed by Cornelius himself and by Britsch. The point of view is illustrated by a recent work (Bercken and Mayer) on Tintoretto.] **J. Evola.** *Sul sistema del “Tantra”.* [An appreciation of recent English studies, by “Avalon,” of the Tantra-system, a North Indian development (some would call it a degradation) of Buddhism.] **Nicola Abbagnano.** *Il problema dell' arte.* [The second paper on the problem of art, dealing with the origins of the new aesthetic. The Greek view of art as imitation persisted throughout the Middle Ages and Renaissance into the modern period. Hume was really the first to define the function of the imagination in art. Abbagnano traces the modern development in the aesthetics of Vico (his vigorous assertion of art as a revelation of reality), of Kant, Hegel, Croce and Gentile.] **Cesare Ranzoli.** *La prova causale dell'a realtà esteriore.* [Realism being defined as any doctrine which affirms a reality independent of the subject who knows it,—whether material or spiritual, unconscious or self-conscious, immanent or transcendent,—it is argued that all such doctrines attempt to explain *obscurum per obscurius*. Höffding's “solid concatenation of our perceptions,” Royce's uniformity between my individual experience and that of others, Wundt's combination of subjective harmony and inter-subjective uniformity, Bergson, Ardigò,—all alike use arguments which rest upon the rejected proof (of external and independent existence) from causality.] **Cordelia Capone.** *La teoria della sensazione in Plotino.* [A useful sketch of the views of Plotinus both on sensation in general, and on the various modes of sensation.]

that
other
on is
ed in
tient
con-
very
nde-
ssed'

senza
and
pina-
on of
itary
gical
a ad-
d by
the
social
s the
it is
and
his-
al or
fans
y of
the
ind;
wed,
ation
lown
The
) on
on of
ndian
icola
blem
ew of
sance
ction
ment
on of
orova
trine
ether
rans-
rum
oyce's
ndt's
mity,
ected
delia
f the
odes